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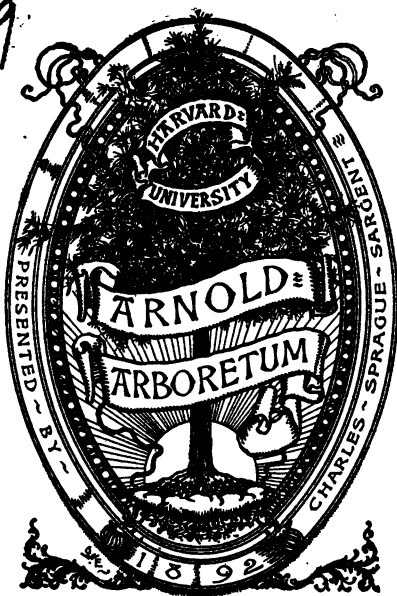
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THE PHYTOLOGIST FOR 1845.

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THE
PHYTOLOGIST:
A
POPULAR
BOTANICAL MISCELLANY.

CONDUCTED BY
GEORGE LUXFORD, A.L.S., F.B.S.E.

VOLUME THE SECOND.



LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.
M.DCCC.XLV.

“ This constitution of Nature, whereby a mental impulse is required to direct and excite muscular action, points to the propriety of teaching the young to observe and examine the qualities and arrangements of external objects. The most pleasing and healthful exercise may thus be secured, and every step be made to add to useful knowledge and individual enjoyment. The botanist, the geologist and the natural historian, experience pleasures in their walks and rambles, of which, from disuse of their eyes and observing powers, the multitude is deprived.”—COOMBE.

PREFACE.

HAVING received many hints that an annual Index would be acceptable to my readers, and an annual tome more convenient than the bulky one which was concluded in 1844, I have unhesitatingly complied, and propose in future to bind each twelve numbers separately, although the pages will for some time be continuous. All the papers published prior to the close of 1844 may be referred to, as in Volume I., and all since that date, and until further notice, as in Volume II.

I believe botanists throughout the kingdom will bear testimony to the increased value of the present Volume. The 'Phytologist' has now become, what I have always wished it to be, the medium through which all our British botanists communicate with the public. It is true a few papers on British Botany still find their way into print through other channels, but when this is the case I consider it an imperative duty to notice them in these pages, giving an abstract of anything that I esteem worthy of preservation, and thus I endeavour to make the 'Phytologist' a complete register of the Botany of Britain. The subject of British Botany is comparatively so limited, that a single periodical, of moderate size, trifling cost, and very humble appearance and pretensions, is quite sufficient to embrace the whole, and while I hope never uncourteously to reject contributions on foreign Botany, I wish my contributors to understand, that my desire is to give a decided preference to that of our own country.

I beg to acknowledge with gratitude the strenuous support and assistance I have received during the year, which is now drawing to a close: it has been peculiarly marked by the expression of good will towards this undertaking; and, though I have generally judged

it best to erase the complimentary expressions of my friends from their various communications, I have not been the less sensible of the kindness intended.

With respect to lists of plants my views may be peculiar, but I cannot refrain from expressing my satisfaction at the great decrease in the number of these transmitted to me for publication. I am not aware of the utility of these lists as generally published. Were they restricted to species of excessive rarity which had not previously been detected in the stations pointed out, I can easily conceive an interest attaching to such records, more particularly if they extend the geographical or geological limits of a species. Or, on the other hand, were such lists complete, as far as regards any precisely defined or geographically circumscribed region, a degree of value would certainly attach to them. But they rarely possess either of these qualifications: a number of the very commonest species and a few rarities are usually given, whilst an equal number of equally common species are omitted, species, the absence of which would be a most interesting fact, and worthy of comment, but which are omitted only through want of care in the compilation, and neither on account of their universal occurrence, nor on account of their entire absence. Under these circumstances such lists appear to me scarcely truthful. The occurrence of such names as those of groundsel and chickweed leads one to suppose that all species have been included, or wherefore these? And the absence of these *names*, while others equally common are given, induces the erroneous conclusion that the *plants* also are absent. I also find that in many instances, the names of rarities have been given without sufficient care, the plants often turning out to have been wrongly named or notoriously introduced.

I have again to acknowledge the obligation I am under to Mr. Luxford for the great care displayed in his editorial superintendence.

I can scarcely conclude these observations without a passing notice of the vast benefit which has lately been conferred on British

botanists by the Messrs. Bentall, of Halstead, in the manufacture of a paper perfectly adapted to the drying of plants. This had long been our chief desideratum, and it is now thoroughly supplied: there will no longer be any excuse for those discoloured, distorted, unintelligible specimens which previously constituted the bulk of all our herbaria. I hope that in thus bearing my humble testimony to the merits of Messrs. Bentalls' paper, botanists will not suspect me of mercenary motives. The small revenue derived from the sale of this paper in London would not induce me to recommend it: but justice to the inventors demands that the influence of the 'Phytologist' should be employed in extending as much as possible the utility of their labours.

EDWARD NEWMAN.

9, Devonshire Street, Bishopsgate,
November, 1845.

ADVERTISEMENT.

'THE PHYTOLOGIST' will be continued both as a monthly and an annual publication. As a monthly, it will contain thirty-two pages of letter-press, occasionally accompanied with illustrations engraved on wood; will be on sale three days before the end of every month; and will be charged one shilling. As an annual it will be sold on or about the 1st of December; will contain twelve monthly numbers, bound and lettered uniformly with the present volume; and will be charged thirteen shillings. An alphabetical list, both of contributors and contents, will be published once in the year.

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THE PHYTOLOGIST.

On Arenaria uliginosa, Leersia oryzoides and Galium Vaillantii.

By EDWARD FORSTER, ESQ., V.P.L.S.

AT the first meeting of the present session of the Linnean Society (November 3, 1844), specimens were presented of three plants hitherto not observed in this country;—all of them very interesting, being apparently indigenous, not garden escapes, nor likely to have been planted by any of those pseudo-botanists who delight in being guilty of such malpractices. Though these have been duly noticed in your *Phytologist* (the announcement of the continuation of which useful work gave me great pleasure), you may not object to a few trifling remarks concerning them.

Arenaria uliginosa, having been described by Sir William Hooker, and figured in the 'Supplement to English Botany,' No. 2890, requires no observation, except perhaps that it may still be doubted whether it ought to be *Spergula* or *Arenaria*, if the two genera are kept separate. It is much to be wished that we might be told who was the actual discoverer of this plant, as it would be an act of justice to record his name; and it would be rather awkward and inconvenient to note in our herbaria,—“Found by one of a little band of botanists, Messrs. J. Tatham, jun., J. Backhouse, sen. and jun., Silvanus Thompson, and G. S. Gibson.” To the last of these travellers I am indebted for a specimen.

Leersia oryzoides, found by Mr. Borrer, in Henfield Levels, where it has probably escaped notice from the flowering spike being concealed in the leaves; which is not always the case on the Continent, from whence I have a specimen, gathered by Mr. Joseph Woods, with the spike quite exposed. This being so well known from foreign specimens, and likely to be described by the finder, in 'English Botany,' needs no further remark.

Galium Vaillantii, discovered by Mr. G. S. Gibson, near Saffron Walden, in Essex, has probably been hitherto overlooked from its affinity to *Galium Aparine*, from which it appears sufficiently distinct. It was well named *Galium Vaillantii* by De Candolle, for it is clearly

Vaillant's *Aparine vulgaris*, semine minori. 'Botanicon Parisiense,' 14, t. 4, f. 4 a, (b is the fruit of *G. Aparine*). Smith refers *Galium spurium* to this figure, observing, "Vaillant's beautiful plate represents these (*seed pods*) hairy, which has caused some doubt as to his synonym. They may vary in this respect, like several others of this genus." It seems, then, that this eminent botanist never saw the Saffron Walden plant. It is possible that it may belong to *G. spurium*, as I can see no difference, except in the seeds, from a specimen of that *Galium*, gathered by the late George Don, near Forfar, which I possess, in his *Herb. Brit.*, No. 104. Yet I still think we have good reason to conceive it to be distinct, unless Mr. Gibson should find, next year, any specimens with smooth fruit—if he does, we may congratulate him on gathering *G. spurium* south of the Tweed. Sebastian Vaillant, whose name is given to this species, if it be so, was demonstrator of Botany in the Royal Garden at Paris, and Fellow of the Academy of Sciences. He did not live to publish the result of his botanical excursions round Paris, and finding his death approaching, he consigned his manuscripts, and the beautiful drawings made for him by Claude Aubriet, to the great Boerhaave, who published them, with the assistance of William Sherard, to whom all the merit of the arrangement is given, stating that he was the only man capable of doing so, and that he had worked from morning to night for this purpose. After the publication, Boerhaave gave the manuscripts and drawings, bound in one volume, to the Academy at Leyden, which he observes will serve to prove the exactness with which he has fulfilled the work of his deceased friend.

EDWARD FORSTER.

Woodford, December 10, 1844.

Notes on Epimedium alpinum and Saxifraga rotundifolia.

BY WILLIAM BORRER, ESQ., F.L.S.

Epimedium alpinum. Having heard that, subsequently to Mr. Woods' vain search, nine years ago, for this plant in Wasdale Scree, it had been found, not in the Scree, but by the side of the river, that issues from Wastwater, I made it one of my objects, in two excursions to Cumberland last summer, to visit it in its native place of growth, if possible, or if not, to ascertain the degree of authority for regarding it as a native of the Lake District. Plants were shown me in a garden at Keswick, said to have been brought from the Scree themselves; and I

visited that wild scene, accompanied by the person said to have brought them—the intelligent guide, Mr. Wright. He did not, indeed, express any very sanguine expectation of being able to show me the plant wild; for he had “found but little, and left less, and he had heard that parties had since been in search of it: but he could show me the very spot where he got it.” Accordingly, the spot was shown, but empty; and a search of five hours on that desolate steep of broken precipice and loose débris was altogether unsuccessful, although we had the statement of another person—of no great credit, as I learned afterwards, for accuracy of assertion—that another part of the Screes, so described that I had no doubt we found it, produced the desideratum “in cart loads.” This visit was made early in June. At the latter end of July I was again in Wasdale, where I obtained information that the plant had been looked for in the Screes many times, and by various parties, in vain, but that it was to be found in a wood by the river half a mile from Santon Bridge, some three miles from Nether Wasdale. There I found it, and wild enough *in appearance* it was: but equally so were *Erica vagans*, and several foreign shrubs not uncommon in our gardens; and I have not the least doubt that it and they were alike introduced by a former proprietor, the projector of a moss-house there, now in decay, and of walks now overgrown. I then called on a nurseryman in the neighbourhood, the reported discoverer of our plant in the Screes. He laughed at the idea of *his* “scrambling after a plant in the Screes, too dangerous a place,” he said, for him: but his foreman, he told me (and the man himself confirmed it), had more than once hunted for it there in vain, and so had a neighbouring clergyman. How the notion that it grew there originated, he knew not. I had heard that he had received a prize for it, as the best British plant exhibited, from a flower-club, at Whitehaven. He was not sure whether he had or had not: he had gained several prizes there. I heard reports, but too vague for investigation, of two other wild stations of the plant in question; one in Borrowdale, the other near Cockermouth. I may add, that the late Rev. R. F. Bree was very positive that he had gathered it “in Helvellyn, near the summit.” He said that he had presented the specimens, with the rest of his herbarium, to a society at Boulogne.

Saxifraga rotundifolia. In June, 1844, I obtained from Miss Wright, of Keswick, a specimen of this beautiful Saxifrage, “gathered by herself, some years since, near the foot of Causey Pike, where it is not now to be found.” Miss Wright’s account encourages a hope that

the plant may be truly a native of our mountains, although it does not establish it as such. It grew, she says, in one spot only, shaded by a rock, among shivers of clay-slate, in a cluster of several plants, very near together. Struck with the beauty of the flower, but not aware that it was anything new to our Flora, she collected all that she saw. The next year she again visited the spot, found a few more specimens, and again gathered them all. In the two years she supposes she collected from fifteen to twenty specimens. In several subsequent visits she has been unable to find a single one, and she considers herself as having completely eradicated her discovery before the place of it was buried, as it has since been, by further shippings of the shivery rock. She conducted me to the spot, which is such as to preclude altogether any suspicion that the plant had escaped from a garden. Can it be that it had been purposely sown?

W. BORRER.

Henfield, Nov. 20, 1844.

On the Falling of the Leaf. By WILLIAM WILSON, Esq.

THE descent of an apple on the head of a philosopher led to the discovery of the laws of gravitation; but hitherto no satisfactory explanation has been given of the cause of its fall at the period of maturity, nor of the spontaneous dehiscence of leaves, so light and buoyant, that even when unmoored from the tree to which they have ministered nourishment, they descend with reluctance to mother earth. So soft and noiseless is their fall, that it needs a contemplative mind to take due notice of the event. Though every leaf has its appointed time of duration, great diversity prevails in reference to the period in different species and tribes. Some, like the poplar and the ash, are tardy in making their appearance, and vanish speedily, while the approach of winter is as yet scarcely perceptible: those of the oak yield only to its more significant frowns: yet all seem to be subject to some general law, and it is my present purpose to inquire what is the rationale of this spontaneous decadence.

A valued friend has endeavoured to throw some light on the subject by remarking, that Nature does nothing by leaps; and therefore it is to be expected that those of our British trees which have evergreen congeners elsewhere, should exhibit, by their long retention of leaves, their participation in the same properties. This view, perhaps, derives some weight from the consideration of such trees as keep the leaves

even after they are withered, and when, the original function being fulfilled, their immediate fall might be considered inevitable. In a less rigorous season, such leaves may, perhaps, remain unchanged for a longer period, and then fall before they are actually withered and dry; for we see that if early frost attacks the leaves of any tree, while yet discharging their proper functions, they wither without falling, and the same happens when excessive drought occasions premature decay.

We may derive some illustration of the cause of dehiscence from the cryptogamic tribes, especially from the thecæ of mosses. I shall select two species of *Hypnum* for examples. On a wall near my residence I have had opportunities of watching attentively, for several seasons, *Hypnum velutinum* and *H. populeum*, which ripen their thecæ at the same period (November), but the first loses its operculum as early as the middle of February, when the peristome expands, and the seeds are dispersed in myriads: *H. populeum* retains the operculum till the end of March, and even longer, the seeds being, meanwhile, pent up within the theca. On taking a very thin longitudinal section of the ripening theca, it will be seen that *H. velutinum* has a large well-formed annulus interposed between the edge of the operculum and the mouth of the theca, and partly lodged in grooves formed in those parts. The section of the annulus is elliptical, with its longer axis nearly upright, but inclined a little inwards, composed of two parallel series of highly succulent cells, which, when dry, contract very much in dimensions, while the contiguous walls of the operculum and the mouth of the mature theca, being formed of small cells of a harder texture, do not contract much in drying. Previous to maturity they all seem to be equally succulent and contractile, and no dehiscence of the operculum can be attained from an unripe theca, except by positive violence producing a rupture, although the line of dehiscence is at all times easily seen. The operculum generally falls on the return of moist weather, succeeding a period of comparative drought; and it seems correct to infer, that during the dry interval the cellules of the annulus, by their contraction, have separated from the surrounding parts, in consequence of the refusal of the walls of the operculum and theca to yield in the same proportion, and thus, on the return of moisture, the annulus, and the teeth of the peristome becoming turgid, a species of elasticity is induced sufficient to throw off the operculum. The turgescence of the moistened annulus, in many species of moss, especially in *Funaria hygrometrica*, is so great as to cause it to bend outwards, the parts becoming quite inverted in their relative positions.

A similar section of the theca of *H. populeum* exhibits no annulus whatever: hence the greater persistency of the operculum is easily accounted for, there being no special organ in this case designed for its removal, or one which is so small and imperfectly developed as to elude detection; yet even here there is a sutural line visible, and it may be supposed that it is through some inequality in the contraction of the parts adjacent, that dehiscence ultimately occurs.

It is easy for an imaginative mind to form theories on any subject, and to support them by plausible arguments, but it seems legitimate to apply the preceding facts in explanation of the fall of leaves. In these the petiole is *usually** attached to the stem of the plant by an articulation, where probably the cellular tissue will be found to be more lax than the adjacent parts. The woody tissue of the petiole is obviously less contractile than the parenchymatous tissue; and as a period must arrive when the cells acquire their maximum of induration, and cease to act in discharge of their original functions, from what may be called a superinduced ossification of parts, previously soft and elastic, the moisture of the sap being no longer supplied to preserve their pristine bulk, the softer cells contract in drying, separate from the adjoining parts, and the woody tissue being also rendered fragile by drying, the whole weight of the leaf is made to fall upon those parts which have not contracted, and are too weak of themselves to sustain the burden.

If this explanation is founded in Nature, it will be found that leaves remain longer upon the trees in seasons of continued moist weather, and for a shorter period when the autumn is a dry one. The return of wet weather after drought may hasten the fall of the leaf, by adding mechanically to its weight, and so also may wind, by producing lateral fracture of the woody parts of the petiole. The question must be considered apart from those circumstances.

It is to be hoped that this subject will be discussed by other observers; and if these views shall prove to be erroneous, I shall still be happy to have supplied a stimulus to some one who shall fortunately arrive at more accurate conclusions.

W. WILSON.

Orford Mount, near Warrington,
December 6, 1844.

* In the holly there is no articulation, and the leaves seem to be pushed off at the end of the second year, by the swelling in spring of the branch immediately above them, rather than to fall off of themselves: a similar event occurs in *Viscum album*, at the end of the first year.

Myosurus minimus, not yet found in Ireland.

By DAVID MOORE, Esq., A.L.S.

SINCE the publication of Mr. Watson's book on the 'Geographical Distribution of British Plants,' attention has been more directed to that subject than formerly, and through the means of local Floras, along with individual contributions, much valuable information has been obtained relative to the distribution of species, though at the same time, errors have crept in through these sources, notwithstanding caution has been used to guard against them, of which the following instance will afford an example.

In the 4th and 5th editions of Sir W. Hooker's 'British Flora,' *Myosurus minimus* is inserted as an Irish plant, on the authority of my worthy friend Mr. Niven, who, no doubt, sent the plant to Sir William, from Ireland, but then he was imposed on by the person who brought the specimens to him, which was done by their being first taken from the botanic garden to the north, and brought back again mixed up with a number of other plants, which were collected on the occasion, with a label attached, distinctly stating the locality where the *Myosurus* was picked, in the county Antrim. The collection was submitted to Mr. Niven's inspection, who being thus thrown off his guard, entertained no doubts of the correctness of the matter, particularly as the person further stated, that a friend was along with him who resided near the place where they found the plant, and who on being written to could forward more specimens, which was actually done, making the fraud complete: anticipating this result, a quantity was left for this purpose.

Myosurus minimus is, therefore, so far as I am aware, still a desideratum to the *Irish Flora*. Nothing could be more culpable than such a trick as this, destroying as it does, the most important feature of our Floras, namely, the distribution and range of the species; and none but a silly person who had no further love for the science but to gain some selfish object, would be guilty of the like. No doubt errors may occasionally arise without the slightest aim at fraud, for instance, *Ledum palustre* was at one time considered an Irish plant, on the authority of a gentleman who saw a piece of it stuck up in a peasant's hat, when passing through a remote place in Connemara, where he supposed it could not have been obtained excepting in a wild state; and those best acquainted with the subject know, that the most accurate observers make mistakes occasionally in the identity of species.

D. MOORE.

Glasnevin, Nov. 1844.

A Visit to Tintern. By C. C. BABINGTON, Esq., M.A., F.L.S.

THINKING that the accounts of botanical excursions which occasionally appear in the 'Phytologist,' are not amongst the least interesting papers which appear in it, I have ventured to give a short notice of a trip made in the early part of July last, to the neighbourhood of Tintern Abbey, in Monmouthshire, not on account of any interesting results springing from it, but for the purpose of recommending that spot to those who may desire to spend two or three days in botanizing amongst as beautiful scenery as can be found in the southern parts of England. Indeed the position of Tintern is so celebrated, that it is only necessary to mention its name to excite, even in those who have not had the good fortune to visit the banks of the Wye, an idea of richness and beauty in its highest perfection: the river winding amongst elevated precipitous and wooded hills; the exquisite ruins; the views, embracing mountain-like summits in Monmouthshire, and on the Welch border to the west, and eastward the extensive plain of Gloucester, traversed by the Severn, whilst the southern distance is chiefly occupied by the wide expanse of the Bristol channel; supply a diversity of beautiful objects that may justly excite admiration.

In this district I had the pleasure of spending the 9th, 10th, and 11th of July, in company with my friend, R. M. Lingwood, Esq., who had come from his residence in Herefordshire to join me; and the more I saw of it, the more I became convinced that these extensive woods afford a rich field for the exploring botanist. My time was unfortunately limited, or I should gladly have prolonged my visit. We arrived at Tintern in the middle of the day, and after taking up our quarters at a nice little rural inn (the Rose and Crown), within a few hundred yards of the Abbey, we walked down the western side of the river for a considerable distance, and noticed *Tragopogon porrifolius* in a far more decidedly wild condition than it has ever elsewhere occurred to me. It was growing in considerable quantity at some distance above the water, and far from any house, in a part of the woods not easily accessible, except by following the banks of the river. Near to the same spot we gathered a very curious monstrosity of *Cerastium*, in which the flower has taken a rose-like form, the sepals and petals exactly resembling whorls of leaves in miniature, and the capsule being formed of precisely similar leaves, attached to each other by their edges, so as to present a series of deep furrows at their junctions, and a prominent ridge at the mid-rib of each. The

calyx, corolla, and capsule, were quite green, and covered on both sides with hairs, as is the case with the leaves. The ovules were elevated upon hairy stalks, and the whole flower affords a most interesting illustration of the views now advocated by all scientific botanists, under the name of Morphology, and which my friend, Professor Edward Forbes, has recently extended to the animal kingdom, by showing that the formation of the reproductive organs of some tribes of zoophytes, is constructed by a precisely similar modification of the ordinary organs of the animal. This is a discovery of the greatest value. A figure of the monstrous *Cerastium* was published some time since, in the 'Gardener's Chronicle.'

In the woods which occupy the slopes of the hills on the same side of the river, is found in plenty, a species of *Euphorbia*, different from any of those recorded in our lists of native plants, but its name is not as yet accurately determined. It is the *E. stricta*, of Reichenbach and Koch, but not of Linnæus and Smith; the plant of the latter authors, which is also known by the name of *E. platyphyllos*, is usually found in corn-fields, or on other cultivated ground, but the new one inhabits woods and thickets, or other wild spots. The Tintern plant is often three or even four feet in length, and has a beautiful appearance, owing to the numerous branches with which its stem is furnished for some distance below the umbel. I do not enter into an account of its characters, which were pointed out to me by Mr. R. Kippist, because he has long intended to illustrate this plant and its allies, in a paper to be communicated to the Linnean Society, and it would be most unjust and ungrateful to anticipate him. Let us hope that he will not much longer allow a subject to remain in obscurity, which he is so well qualified to illustrate. The plant is found for three or four miles along the valley, growing in the woods, and close to the road-side, and in many places on the steep banks of the river.

Writing from recollection alone, I do not endeavour to mention the many interesting plants which inhabit these woods, but only the few which peculiarly attracted my attention, and impressed themselves upon my memory. Had I contemplated the present notice, careful lists of plants would have been prepared, and notes taken upon the spot. This is of but little, if of any, consequence, since a very complete reference to them, and their stations, will be found in Mr. Watson's valuable 'New Botanist's Guide.'

The following day was spent on the opposite side of the river, where one of the first plants which attracted our attention was the *Campanula latifolia*, which I had been accustomed to consider as being con-

find to the northern counties of England, nor do I find it to be recorded as a native of the southern part of our country. It is very plentiful in the woods on the eastern side of the river near Tintern. By following the ridge of the hill at the upper edge of the woods for some distance, a remarkable projecting rock is attained, which, rising out of the trees, commands a very extensive and beautiful view, and is well worthy of a visit. It is called the 'Devil's Pulpit.' How remarkable it is that the most curious rocks, caves, and other hollows, and also some of the grandest works of man's hands, should so universally be attributed to the agency of that being by those who do not possess the knowledge requisite for referring them to their true causes.

The summit of the hills, which form the northern extremity of the Forest of Dean, and lie between the Wye and Severn, is occupied by sandy tracts of heath, interspersed with woods and thickets, and only partially cultivated. The plants common to such places are found upon them, but I do not remember noticing any peculiar species, except a sub-erect *Rubus*, which I have never noticed elsewhere, and suspect to be undescribed. This genus is so difficult, that I am not now prepared to give a more decided opinion concerning it. Although but few plants occupied our boxes, we were fully repaid for our walk, by the constant change of scene and the ever-varying prospects afforded to us.

On the third day we visited a lateral valley to the village of Trellech, where there is a spring very strongly charged with iron, and three enormous monumental stones, from which the place takes its name; but their history is lost in antiquity. We passed by the way an extensive peat-moss, producing the plants usually inhabiting such places, and pursued our course by a hilly road to Monmouth.

Should this sketch afford any gratification to its readers, or lead any of them to visit the district, and explore it for themselves, it will have fulfilled one object which I have had in view, the other being to show my satisfaction at the prospect of the 'Phytologist' continuing to run its useful course.

CHARLES C. BABINGTON.

St. John's College, Cambridge,
December, 7, 1844.

*Some account of the *Oenanthe pimpinelloides*, and *peucedanifolia* of English Authors.* By HEWETT C. WATSON, Esq., F.L.S.

MUCH confusion and consequent misapplication of names occur in the writings of English botanists, previous to the present year of 1844, in relation to the plants above-mentioned. Hudson described a single species only, under the name of "*pimpinelloides*;" having either applied this name to the wrong species, or confounded two species under the one name. Smith and succeeding British authors kept the same name in their works, usually or always applying it to the wrong species also. But they likewise distinguished a second species, to which the name "*peucedanifolia*" has been universally applied until the present year.

Meanwhile, several continental authors were referring the two species figured in '*English Botany*,' 347 and 348, under the above names, the one to *Lachenalii* of Gmelin, and the other to *silafolia* of Bieberstein. English authors were slow to adopt these names; and in one instance, I think, correctly so. In the fourth edition of the '*British Flora*,' 1838 (I have not the earlier editions now by me), Sir W. J. Hooker still kept to the two names of *English Botany*, but observed of the plants, "they are certainly not the species so called by De Candolle, and other continental writers." Notwithstanding this observation, the same two names were still repeated in the *Edinburgh Catalogue*, in 1841, and also in the fifth edition of the '*British Flora*,' in 1842.

I think that the first decided change in the right direction, was made in the '*Manual of British Botany*,' in 1843. Following continental botanists, Mr. Babington applied the name of *Lachenalii* to the species described by Smith, and figured in *English Botany*, under the name of *pimpinelloides*. At the same time he fell into the very excusable error of rejecting the true *pimpinelloides* wholly. Yet specimens were then to be seen in several English herbaria; although, it would seem, unknown to Mr. Babington. Specimens of the true Linnæan *pimpinelloides* had been sent to the Botanical Society of London, correctly labelled by Mr. Edwin Lees, in 1839 and 1840; but this was "throwing pearls," &c. I had myself collected the same species, in a very young state, in the Isle of Wight, in May of 1840; and afterwards obtained a full series of specimens by cultivating the plant in my garden. The rejection of *pimpinelloides* wholly from the '*Manual of Botany*,' induced me to compare these garden specimens of a native species with the true *pimpinelloides*, in the herbarium

of Sir W. J. Hooker. Satisfied by this comparison, that the rejected name was nevertheless correct, it was retained in the London Catalogue of British Plants, compiled in the Christmas week of 1843. In doing so, however, I fell into an error parallel with that of Mr. Babington, namely, rejecting one species, and retaining two only. The author of the Manual evidently did not understand the *peucedanifolia* of Smith. The Edinburgh botanists were distributing the *Lachenalii* under that name. And Smith himself had made this appear correct, by describing the fruit of a foreign species (which resembles that of *Lachenalii*), as the fruit of his *peucedanifolia*. Under these circumstances, I supposed that the *Lachenalii* and *peucedanifolia*, of the 'Manual,' might be identical; even though Smith's *pimpinelloides* was meant by the former name.

In 1844, the subject came under the attention of Mr. Ball, whose practical knowledge of European plants and works enabled him to clear away much of the obscurity. In his paper, published in the 'Annals of Natural History,' (July, 1844), he described three British species, namely, *pimpinelloides*, *Lachenalii*, and *silaifolia*—intending the *peucedanifolia* of Smith under this latter name. Mr. Ball's paper was forthwith followed (*Annals*, August, 1844), by some good critical remarks, from the pen of Mr. Babington, who concurred with Mr. Ball in admitting the three species; although not altogether so in regard to their nomenclature. But it is made pretty evident, by their papers in the 'Annals,' that neither of these two accurate botanists were in possession of a sufficient series of English specimens. In particular, Mr. Ball gives no description of the fruit of *pimpinelloides*, and describes that of his *silaifolia* only, from immature specimens, which do not suffice. After examining a number of specimens lately sent to the Botanical Society, from various localities, along with others in my own herbarium, I think the subject may now be rendered tolerably clear.

The roots of all three species consist of a cluster of fibres, which are enlarged into tubers, through some portion of their length. The forms of these tubers differ much, and afford good characters to separate one species at least from the other two. Still they vary greatly even in the same species; and single tubers might be taken from one species, which would then readily pass for those of another. In all three species the tubers are continued below into thread-like roots; so that no specific distinction can be founded on this change. The leaves are bipinnate, varying to tripinnate, or pinnate; their leaflets entire, or variously lobed and cleft. The leaflets and seg-

ments of the upper leaves are more or less linear; those of the lower leaves broader, and very variable in the same species. This variability renders it difficult to apply definite terms, which shall not be contradicted by some of the leaves; and yet the eye will tolerably well distinguish the species by their leaves, when once familiar with them. The uncertainty in the presence (or rather persistence) of the involucre, has led to error and confusion; too much value having been attached to that organ, in framing specific characters. The fruit affords excellent characters, in its different forms, and by the presence or absence of a thickened (callous) base, of a pale or yellowish-brown colour. This is not to be confounded with the dilated summit of the pedicel, which is seen, more or less, in each species. The callosity is still part of the fruit, after separation from the pedicel. With these explanations, I trust that the following characters will enable any botanist to name his specimens. I add the localities from which I have examined specimens, since little reliance can be placed on those published in books.

1. *Enanthe pimpinelloides*, Linn. Tubers oval or sub-spherical, connected to the base of the stem by a slender peduncle, (*i. e.* a portion of the fibre, which is not enlarged into the tuber). Leaflets and segments very acute or mucronate; those of the radical leaves much broader and shorter. Involucre many-leaved (about six), usually persistent. Fruit cylindrical, as broad as the calyx, callous at the base, distinctly pedicellate, free in the umbellule. *Æ. pimpinelloides*, Lees, in 'Phytologist,' &c.; London Catalogue; Ball, in Annals. Not of Smith; Hooker; Lindley; Edinburgh Catalogue, nor English Botany, 384. There appears no difficulty about continental synonyms here. The specimens in the Linnæan herbarium, wanting root and fruit, apparently belong here; and it is no doubt the species of De Candolle, and European authors generally. Near Cruckbarrow Hill, and on hilly ground, at Powick, both in Worcestershire; also on dry hilly ground at Forthampton, Gloucestershire: Mr. Edwin Lees. In Hayfields, at Fifehead Neville, Dorset: Mrs. Wyndham, and Mr. W. C. Trevelyan. On a hedge-bank, near Shanklin, in the Isle of Wight. The Shanklin plant has longer tubers, and broader leaves. I have not seen mature fruit of plants from the other localities. The half-grown fruit from Cruckbarrow Hill, is remarkable in having the pedicel itself thickened and callous.

2. *Enanthe Lachenalii*, Gmel. Tubers elongate, slender, clavate, fusiform, or sub-cylindrical, sessile, (the thickening of the fibre commencing from its origin at the base of the stem). Leaflets of the lower

leaves linear-obovate, or wedge-shaped and trifid, obtuse, mucronate; those of the upper leaves sub-acute. Involucrum many-leaved (about six or eight) usually persistent. Fruit oblong or turbinate, broader than the calyx, tapering below, without callosity at the base, shortly pedicellate, densely crowded in the umbellule. *Æ. Lachenalii*, Bab. Man.; Ball, in Annals. *Æ. pimpinelloides*, Hudson; Smith; Hooker; Lindley; Eng. Bot. 348; and most English writers. This appears to be certainly the species of Gmelin; De Candolle and Duby; Lejeune and Courtois; Reichenbach; Koch, &c. Mr. Ball and Mr. Babington rightly state this to be the commonest of the three species. I have it from many places on the coast,—from Cornwall northward to the firths of Forth and Clyde; as also from places inland. Among some scores of specimens, the inland plants generally have the roots longer and more slender, while their fruits are rather smaller, and less narrowed at the base. But a specimen from Michelfeld, near Basle, has a tuber (the only one left attached) as short and thick as some of the most elongated tubers on British specimens of the next species, Smith's *peucedanifolia*. Judging by the labels which have come into my hands, the inland plants are usually called *pimpinelloides*, by English botanists; while those from the coast are labelled as *peucedanifolia*.

3. *Enanthe Smithii* (temporary name). Tubers rather short, thick, clavate, or oblong-fusiform, sessile. Leaflets and segments of the lower stem-leaves linear-lanceolate, acute, scarcely broader than those of the upper leaves. Involucrum usually few-leaved (1-3) very deciduous (or wholly absent?). Fruit subcylindrical, scarcely so broad as the calyx, callous at the base, shortly pedicellate, crowded in the umbellules. Branches very fistulose. *Æ. peucedanifolia*, Smith; Hooker; Lindley; Babington; Eng. Bot. 347. *Æ. silaifolia*, Ball, in Annals. I cannot suppose this to be the *silaifolia* of Bieberstein, which is described with the lower leaves "valde abbreviatis atque dilatatis." The lowest leaves which I have seen, show no approach to this character; but I have not seen the very lowest, or early radical leaves. Many authors agree that it is not the *peucedanifolia* of Pollich. And if it is neither of these species, I really know not how to name it, except as a nameless species, which may appropriately take that of Smith, its early or first describer. Mr. Babington is correct in considering it the *silaifolia* of Koch's Synopsis, if we may judge by his description, particularly of the fruit. Amberley, Sussex: Winch's Herb. Near Bedford: Sowerby, in Smith's Herb. Banks of the Severn, near Deerhurst; also Tewkesbury Severn Ham,

Gloucestershire: Mr. Edwin Lees. Longdon marsh, near Upton-on-Severn, Worcestershire: Mr. Buckman. In a meadow between the Ambien wood, and Sutton wharf, Leicestershire: Rev. A. Bloxam. Short clavate tubers prevail in the Leicestershire specimens; those from Longdon vary, more or less, to fusiform.

And now, with a few words in notification of past errors, I may conclude this notice of the plants. As far as I am myself concerned, the three species were not understood before last month. The only one well known to me (from 1841) was the *pimpinelloides* (Linn.), and with that I was confusing rootless and fruitless specimens of Smith's *pimpinelloides*, which is Babington's *Lachenalii*; my fruit-bearing specimens of this latter being equally confused with Smith's *peucedanifolia*. This sort of division of *Lachenalii*, between the two others, pervades all the writers on these plants and their localities, before 1843 or 1844. Mr. Lees was acquainted with *pimpinelloides*, but up to this present year, his labelled specimens show that he confused the other two together, under the name of *peucedanifolia*. When writing his 'Manual,' Mr. Babington must have known *Lachenalii*, but neither of the others sufficiently. I fear that even Mr. Ball has mingled specimens of the *peucedanifolia* and *Lachenalii*, under the name of *silaifolia*. His description of the fruit of his *silaifolia*, "exiguum, clavatum (ad basin ut videtur haud incrassatum), inferne quidquam contractum," is far from applicable to my specimens. While immature, the fruits of all are contracted downwards; and this contraction is permanent in those of *Lachenalii*, especially in those fruits which are crowded together in the centre of the umbellule, and have scarce room to expand. The "exiguum," if general smallness is implied, cannot suit Smith's *peucedanifolia*, the fruit of which is longer than the fruit of either of the other species: it may be rather more slender. It has certainly the callous base, distinct before maturity. The "cartilaginous and minutely denticulate margin" of the leaflets, is to be seen on those of *Lachenalii* equally as on the leaflets of *pimpinelloides*. Lastly, the greater or less thickness of the tubers, though influenced by age, is more affected by some other circumstance; since some of the thickest tubers of *Lachenalii* occur in younger specimens; while some of those advanced in fruit are distinguished by their long slender tubers.

H. C. WATSON.

Thames Ditton,
Nov. 28, 1844.

Notes on a Botanical Tour in Germany.

By JOSEPH WOODS, ESQ., F.L.S.

I LEFT London on the 16th of May, 1844, but the wet weather for some days prevented my botanizing, and urged me on, since I could travel in the rain, with less inconvenience than I could walk about in it. On the 21st I ascended the Rhine in a steamer to Coblenz. The steamer was nine hours in ascending from Cologne to Coblenz. On the 22nd I had a botanical walk, under the auspices of Mr. Wertgen. We crossed the Moselle, and turning to the left, walked to the nearest hills above the river. It was not, perhaps, one of the pleasantest walks about Coblenz for scenery; yet, after reaching the hills, the views were often very beautiful, stretching over the lower country about Coblenz to the hills beyond the Rhine, and in another direction along the more contracted valley of the Moselle. The eminencies on which we were, are dotted over with little bits of wood, left in order to supply fuel to the neighbourhood. I need not mention such plants as *Salvia pratensis*, *Euphorbia cyparissias*, &c., which are found almost everywhere on the Continent, but proceed to those of less general occurrence. In the meadows near the Moselle our first prize was *Tragopogon orientalis*, distinguished by Koch, from *T. pratensis*, by the beak of the marginal seeds being only about half as long as the seed itself, while in *T. pratensis* this beak is as long as the seed. *Veronica præcox* occurred occasionally among the corn, but was almost over; as was also *Holosteum umbellatum*. Some of the latter belonged to the hairy variety, which has been called *H. ciliatum*. *Arabis arvensis* is exceedingly abundant. *Euphorbia esula* and *E. Gerardi* grow on the banks of the river: and here we find also *Allium schœnoprasum*. This has not the twisted leaves of the Cornish plant, which is probably *A. sibiricum*. In the woods, or on their borders, we met with *Ranunculus polyanthemus*, *Dentaria bulbifera*, *Genista sagittalis*, *Vicia tenuifolia*, *Ribes alpinum*, *Galium sylvaticum*, abundantly, but not showing yet any signs of flower. *Hieracium præaltum*, *Gnaphalium dioicum*, *Campanula persicifolia*, *Pulmonaria officinalis*, *Myosotis stricta*, and the var. of *M. palustris* with deflexed hairs on the stem. *Melampyrum arvense*, *M. cristatum*, *Alnus incana*, *Orchis fusca*, *O. militaris*, and *O. chlorantha*, *Ornithogalum umbellatum*, *Convallaria majalis*, and *C. multiflora*, *Luzula albida*, *Carex tomentosa*, and a variety of *C. præcox*, which is probably *C. umbrosa*, of Host.

We descended the hills to a village called Kultz, and crossing the river by a ferry, returned along the right bank to Coblenz.

On the 23rd I botanized with Mr. Wertgen, on the east bank of the Rhine. After crossing the bridge we ascended the hills, and again descended into the upper part of the Mühlbach, where there is some boggy ground, on which we found what appears to be a variety of *Eriophorum pubescens*, with smooth stalks. We then kept up the hills rather to the left, and again sweeping round to the right, followed nearly the ridge of the hills which bound the valley of the Lahn, whence we looked down upon Ems. We gathered *Genista germanica* (in some places this, *G. sagittalis* and *G. pilosa* were all in flower together), *Trifolium alpestre*, *Mespilus germanica*, *Pimpinella magna*, *Carum Carui*, *Lonicera Xylosteum* in fruit, *Phyteuma nigrum* and *P. orbiculare*, *Pyrola minor*, *Anthericum Liliago*, and *Carex montana*. On our return along the valley of the Rhine we got a few plants of *Barbarea arenata*, but the grass of the bank on which it grows had just been cut, and the plants carried away.

On the 24th I went in the steam-boat to Bingen, and thence in an omnibus to Kreuznach. *Erysimum crepidifolium* abounds everywhere on the road-side. The scenery appeared tame, but I found some of a very different character, when I walked to the Rhein-Grafenstein the next day. There is a singular mixture of wild and tame above Kreuznach; and we come suddenly on cliffs 500 or 600 feet perpendicular, wondering how they got there. In my walk I observed the following plants:—

<i>Anemone Pulsatilla</i>	<i>Lychnis viscaria</i>	<i>Hieracium maculatum</i> , Sm.?
<i>Helleborus foetidus</i>	<i>Trifolium montanum</i>	<i>Centaurea montana</i>
<i>Tilia grandifolia</i>	<i>T. alpestre</i>	<i>Cineraria campestris</i> ?
<i>T. parvifolia</i>	<i>Cotoneaster vulgaris</i>	<i>Lonicera Xylosteum</i>
<i>Acer monspessulanum</i>	<i>Amelanchier vulgaris</i>	<i>Cynanchum Vincetoxicum</i>
<i>Camelina sativa</i>	<i>Sedum rupestre</i>	<i>Ajuga genevensis</i>
<i>Biscutella lævigata</i>	<i>Ribes alpinum</i>	<i>Veronica prostrata</i>
<i>Alyssum montanum</i>	<i>Galium glaucum</i>	<i>Rumex scutatus</i>
<i>Brassica Cheiranthus</i>	<i>Carum Carui</i>	<i>Anthericum Liliago</i>
<i>Erysimum crepidifolium</i>	<i>C. Bulbocastanum</i>	<i>Carex ericetorum</i>
<i>Cardamine impatiens</i>	<i>Lactuca perennis</i>	<i>Melica ciliata</i>
<i>Scleranthus perennis</i>	<i>Hieracium Peleterianum</i>	<i>Asplenium septentrionale</i>
<i>Dianthus cæsius</i>	<i>H. præmorsum</i>	

Lychnis viscaria and *Dianthus cæsius* were in great beauty and perfection, and very abundant, and so were, in a more limited space, *Biscutella lævigata*, *Anthericum Liliago* and *Hieracium Peleterianum*, and another of the family of *H. murorum*, with lanceolate leaves, often spotted. It is, I suppose, the *H. maculatum* of Smith. *H. Pilosella* and *H. murorum* were plentiful in the same place; and as far as the evi-

dence there found would go, nobody would doubt the two latter being perfectly distinct from the former.

On the 26th, I made an excursion on a cold and somewhat wet afternoon with Mr. Dellman, to get *Saxifraga sponhemica* and *Oxytropis pilosa*. The first we found in great abundance. It grows just where the little stream of the Ellerbach issues above Sponheim, from a rocky gorge. I would not pronounce it different from *S. hypnoides*; but as this is the original place whence the plant was first described, and from whence the name was taken, it was well worth an effort. The petiole is flat, while that of *S. hypnoides*, according to Koch, is inflated and semiterete. In the other we failed. Mr. Dellman had not himself gathered it, and we probably missed the precise spot, for there is sufficient authority to make us believe that it exists abundantly somewhere near the Castle of Bockenheim, and there is plenty of wild, rocky, and broken ground about, which it would take almost a day to examine; and it was nearly 8 o'clock before we got there. The manner in which plants disappear is often very curious. We find a species common in a certain district, which seems its natural position. Leaving this we meet with it in particular spots, but not spreading over the country. These outliers become more and more detached, and there is sometimes a distance of 50 or even 100 miles from one of them to the nearest point where the plant is again found; yet still it is there abundant, though one sees no reason why, growing there, it should not also occur in a hundred other places in the same neighbourhood. Last of all the individuals become very scarce, even in these localities. *Oxytropis pilosa* is a plant of eastern Germany, and is said not to be found elsewhere among all the valleys of the Rhine. *Cistus hirsutus* has made a longer leap than this, not being found between Brittany and Spain; and *Ononis reclinata* (or *mollis*) skips over part of France, and the whole of England, to fix itself on the Mull of Galloway. *Tragopogon orientalis* is abundant in the meadows, and *Achillæa nobilis* on walls and dry banks.

On the 28th I walked to Roxheim, gathering by the way *Veronica triphyllos* and *præcox*. From Roxheim I proceeded towards Gutenberg, and just as the road begins to descend towards the latter place, gathered the *Anemone sylvestris*, which was the chief object of my walk. It is very abundant, but in a very limited district, and I roamed through the woods on each side without meeting with any more of it. In the same place grew *Orchis militaris*. The lip, in all I saw of this plant in Germany, keeps very steadily to one form, while

in those which I gathered last year in France (Phytol. i. 789) it was continually varying. *Rosa spinosissima* is here glandular in the veins and on the margin, forming double serratures; perhaps *R. myriacantha* of De Candolle. This form seems, however, nearly confined to the neighbourhood of Roxheim.

On the 29th I went to the salt-works, where long sheds covering a high pile of faggots deform the valley,—and ascended the Rothenfells, one side of which forms a magnificent precipice of reddish porphyry, of I suppose above 600 feet in height. The gentler slope on the north side afforded *Potentilla rupestris*, and on the upper part abundance of *Orchis sambucina*, but almost out of flower. On the steep descent to the south, there was abundance of *Dictamnus Fraxinella*, and I sat down to admire its magnificent tufts before I attempted to gather them. I then crossed the Nähe by a ferry; and after gathering *Saxifraga aizoon* near the river, scrambled up the hollow which separates the Rhein-grafenstein from the Gans. Here was none of the *Biscutella lævigata* which I had found the day before so abundantly in a similar hollow; and it is remarkable, that *Dianthus cæsius*, which is here so abundant, does not grow on the opposite rocks of the Rothenfells, while on the other hand, the *Dictamnus* is not found on the Gans, or the Rhein-grafenstein, and the *Orchis sambucina* very sparingly, or not at all. In such rambles, an Englishman misses some plants elsewhere common in his own country, such as the two species of *Ulex* and *Scilla nutans*, none of which seem to be found on the Rhine.

On the 30th I hunted for the *Asarum*, which, as Mr. Dellman assured me, grows about two miles from Kreuznach, on the foot of some rocks on the banks of the Ellerbach. I found it in fruit, but the dry permanent nature of the blossoms left me little to regret. In the afternoon I went to Bingen; and on the 31st, had a walk up and round the Reichers Berg, to hunt for *Sagina ciliata*, which I did not find. My only prize was *Potentilla alba*, pretty completely out of flower. *Podospermum laciniatum*, *Crepis tectorum*, *Silene conica*, and one or two other plants not rare on the Continent, but which I had not lately seen, occurred near the chapel. The walk, however, is a beautiful one, with finely varied views on the Rhine, and on the Nähe. The views up the Rhine, in particular, are delightful; and only want the effect of a mixture of larger trees to rival the most perfect river-scenes in Europe. Afterwards I proceeded to Maintz, where I did little. The immediate neighbourhood is not favourable to Botany—I know not what it may offer at a greater distance. The

immense fortifications occupy a considerable space all round the town, and beyond these, all the level spaces seem occupied by corn, and the slopes by vineyards. *Euphorbia esula*, *E. stricta*, and *E. Gerardiana* are abundant, and in some places *Anchusa officinalis*. *Iris spuria* grows in some meadows on the right bank of the Rhine, near Gisheim, but I sought for it without success. At Mannheim, I had on a former occasion gathered *Trapa natans*, but I could not now find it. I had also remarked a sandy tract of low hills, partially covered with pine-woods, where I had met with *Kochia arenaria* and *Alyssum montanum*. I thought a further investigation, and at an earlier season, could not fail to be productive. I was not disappointed, since *Pyrola umbellata* grows there, but the flowers were not open. *P. chlorantha* was in great abundance, and in good condition, but unfortunately, at the time I supposed it to be, *Pyrola minor*. This and *P. secunda* are also found in this tract; and one or two specimens of *P. minor* and *uniflora* are said to have been gathered here. The *Monotropa* had just begun to exhibit above ground its curved stem. *Orchis militaris* here grows on the sand; and *Crepis tectorum* and *Phleum Boehmeri* are plentiful. The other plants found in my walk, were *Diplotaxis viminea* and *Erucastrum Pollichii*. I hunted the meadows both on the Nâhe and the Rhine, without finding anything interesting.

On the evening of the 4th I went to Dürkheim, and botanized there on the 5th and 6th. The best stations are little bushy banks here and there found among the vineyards, on a low range of hills on the north-east of the town, which are partially calcareous. Here grow *Stipa pennata*, *Inula germanica* not yet in flower, *Globularia vulgaris*, *Galium glaucum* in fruit. *Arenaria Jacquinii* is very abundant. I know not why Koch has rejected the names both of Jacquin and of De Candolle, to give one of his own. *Physalis Alkekengi* grows in one corner of a vineyard; but these corners and bushy slopes have been much abridged, and the plant is all but extirpated. Mr. König had showed it me three years ago. *Althæa hirsuta* is said to be confined to one spot, but I happened to light upon it. There are also *Linum tenuifolium*, *Sedum rupestre* and *Crepis tectorum*, with *Sclera carissa* and *Dianthus prolifer*. *Anthericum ramosum*, which I had gathered in full flower on the 8th of July, three years ago, did not yet show its flowering stems. A *Potentilla*, which I suppose to be *cinerea*, but which I confess I cannot with any certainty distinguish from *P. verna*, is also very abundant.

(To be continued).

Notice of 'The Annals and Magazine of Natural History,'
No. 93. December, 1844.

THE botanical articles in this number are three : a continuation of Mr. Ralfs' paper on the Desmideæ, which was read before the Botanical Society of Edinburgh, in last June; an abstract by Mr. Henfrey, of M. Gaudichaud's report on M. Duchartre's memoir 'On the Organogeny of the Flower, and particularly of the Ovary, in Plants with a free central Placenta;' and a review of Newman's 'History of British Ferns.'

Mr. Ralfs' paper describes the genus *Cosmarium*, of Corda, and ten species, several of which appear to be new. They are found, like the other genera and species of this obscure but not uninteresting tribe of plants, in boggy pools; many of them by the author, near Penzance and Dolgelly, others in Sussex, by Mr. Jenner, and in various localities by other botanists. We have experienced much pleasure in viewing these minute plants aided by a powerful microscope; and sincerely hope that through the labours of Messrs. Ralfs, Jenner, and Hassal, they will, ere long, be introduced more fully to the notice of our British botanists.

The paper on Organogeny will be read with some interest by those who study this abstruse yet highly important branch of botanical science; but we cannot venture on making a further abridgement, and must be content with extracting this brief summary of the author's views.

1. All organization commences in the cell.
2. Every so-called appendicular organ of vegetation and fructification results from a cell endued with vitality.
3. The organized cell produces a bud of leaves, flowers, or ovules.
4. All pre-exists in every such bud; no fresh organization is added to it, any more than to the cell.
5. The order of succession of the parts in the leaf or flower-buds, as well as in the ovules, always takes place from the circumference to the centre.

The review of the 'History of British Ferns,' is very flattering to the author of that work, and is evidently written by one who is master of the subject.

Commencing with the Equisetaceæ, we observe the reviewer admits the necessity of the somewhat startling changes proposed in their nomenclature, as : —

Equisetum Mackaii, Newman, *vice* *elongatum*, Hooker,
fluviale, Linneus, *vice* *limosum*, Smith and Hooker,
umbrosum, Willdenow, *vice* *Drummondii*, Hooker,
Telmateia, Ehrhart, *vice* *fluviale*, Smith and Hooker.

This is particularly gratifying, since the Equisetaceæ were originally published in the 'Phytologist,' and several protests have been entered against the changes. It has always appeared to us that the more nearly we can attain uniformity in botanical nomenclature, the more simple and intelligible will the study become; and since our continental neighbours are not likely to adopt little errors which we may have accidentally committed in these matters, it is better for us to correct them with a good grace as soon as they are made manifest. The reviewer entertains similar views of numerous other changes proposed by Mr. Newman.

The vexed question of *Lastrea dilatata* is fully discussed by the reviewer, and the three species proposed by Mr. Newman freely admitted to be such: the reviewer, however, does not assent to the proposed new nomenclature; the name of *recurva* he considers objectionable, and to "convey a totally wrong idea of the character of the frond." On this point we are somewhat at issue with our contemporary. Mr. Newman had no choice in the selection of the name, as it is confessedly the only one under which the species had been previously described, and we much doubt whether it *does* convey a wrong idea: the edges of the pinnules and divisions are *bent backwards*, or recurved, and form little concavities on the surface of the frond. In *Pteris Aquilina*, Mr. Newman, following many of the highest authorities, has described the margin of the pinnules as "*incurved*," a description which we believe has never been criticised; indeed, the term *incurved* is almost invariably employed to express this character. Now the margin in *L. recurva* being curled back in an exactly opposite direction to that in *Pteris Aquilina*, &c., may, with like propriety, be called *re-curved*. On many other species there are observations quite worth perusing, and we may characterize the entire review as penned with fairness and good feeling.

The following note on *Elatine Hydropiper* will be read with interest. "Mr. W. O. Newnham, of St. John's College, Cambridge, has found this very rare plant in two ponds near Farnham, Surrey, on opposite sides of the town, namely, Frensham pond, and Cuck Mills pond: in both places it was accompanied by *E. hexandra*. It is a most interesting addition to the Flora of the south of England, and the young naturalist by whom it has been discovered, deserves great

credit for accuracy of observation. The only recorded habitats are in Anglesea and Ireland.—C. C. B.”

Notice of the ‘London Journal of Botany.’ No. 36. December, 1844.

This number contains the following papers : —

‘Notes on the Botany of the Azores,’ by *Hewett C. Watson, Esq.*

‘Description of a new British species of *Helianthemum*,’ by *J. E. Planchon, Docteur en Sciences de Montpellier.*

‘Description of a new species of the genus *Eudema*,’ by *J. E. Planchon, Docteur en Sciences de Montpellier.*

‘Description of a new species of *Calycophyllum*, from British Guiana,’ by the *Chevalier Robert H. Schomburgk, Ph. D.*

‘On two new species of the Laurineæ from the forests of Guiana ;’ by the *Chevalier Robert H. Schomburgk, Ph. D.*

‘Diagnoses Muscorum quorundam Javanicorum,’ auctore *Dr. C. Montagne.*

‘Lichenes Antartici; being characters and brief descriptions of the new Lichens discovered in the southern circum-polar regions, Van Diemen’s Land, and New Zealand, during the voyage of H. M. discovery ships, *Erebus* and *Terror*,’ by *Dr. J. D. Hooker, and Dr. Thomas Taylor.*

‘Plantæ Cellulares quas in insulis Philippinensibus a cl. Cuming collectæ recensuit observationibus nonnullis descriptionibusque illustravit.’ *C. Montagne, D.M.*

Of these papers, the second will be considered the most interesting to British botanists; and this we should have entitled somewhat differently, since it is a proposed change in the name of the Anglesea *Helianthemum guttatum*, rather than a description of a new British species. M. Planchon thinks the *Cistus guttatus* of Hudson a distinct plant from the *Helianthemum guttatum* of the south of France; and he proposes to call the former *Helianthemum Breweri*. He appears to regard the *Helianthemum guttatum* of English Floras, as composed of two plants. One found in Jersey he believes to be a hispid variety of the true *H. guttatum*; the other, first found by Mr. Brewer, and subsequently by other botanists, in Anglesea, he considers distinct, and assigns it the following characters : —

“*Helianthemum Breweri*; Planchon. *Helianthemum* (E. sectione *Tuberaria*) annuum a basi ramosum subdiffusum viscidulo-hispidum, pedicellis bracteatis defloratis, subdeflexis fructiferis erecto-patentibus,

petalis angustis immaculatis, staminibus 8-12, seminibus quam in *H. guttato* majoribus.

"Hab. Anglesey, Mr. Brewer, *Hudson*. Holyhead mountain, Rev. Mr. Williams, and also near Amlwch, Rev. H. Davies, W. Wilson, Esq."

*Notice of the Naturalists' Almanack, for 1845.**

WE learn from the advertisements that this useful little Almanack for the coming year has been edited by Mr. Henry Doubleday, than whom we have no naturalist more competent to the task; and on the present occasion he has accomplished his undertaking in a manner that fully bears out his previous reputation for pains-taking and accurate observation. Mr. Doubleday's well-known predilection for birds and insects, has, of course, led him to devote a great portion of the space to these interesting classes; but there are valuable notices of plants scattered throughout the '*Naturalists' Calendar*;' and p. 29 is filled with a list of the dates, during four successive years, on which a great number of plants came into flower at Epping. We should prefer a portion of each year's Almanack being occupied by a complete monograph of some small family of British plants or animals, since such monographs give the work a far more *enduring* interest; and render it a desideratum to naturalists, long after the year of its date has expired. We have heard many commendatory observations on the Almanack for 1844, on the ground of its containing Mr. Newman's descriptive list of the British Ferns; and we believe it is still sought for on this account, even at a time when its value, as a diary of scientific meetings, and the usual almanack matter, has expired.

On the Influence of the Mild Climate of Torquay on Flowering Plants. By J. A. WALKER, Esq., Lieut. H. P., 34th Regt.

Nov. 1. I BEG to send a few fragments of bloom which still lingers, in my sea-side garden, on the Privet, Dog-rose, and Gum Cistus. Of the first there is a good deal: of the others, only a solitary blossom here and there. In December, 1842, there was, up to the 10th or 12th of the month, a Dahlia in very good bloom, within a few feet of the edge

* Van Voorst's *Naturalists' Pocket Almanack*, for 1845. John Van Voorst, Paternoster Row.

of the rocks, and with no other shelter than a parapet wall just high enough to ensure the safety of my younger pupils. (Aspect S.W.)

It is one of the marked peculiarities of the Torbay district, that not only ordinary trees, but many evergreens, thrive almost within a stone's cast of the high-water mark. I believe the same circumstance is observable on some parts of the sea-coast near the town of Wexford, Ireland. In noting the distribution of plants, it might be worthy of inquiry, what varieties marked localities favourable to health, and the reverse.

Nov. 26. I beg to inclose a wild strawberry which was found in a wood near Torquay, yesterday, weighing, when pulled, including the stalk, rather more than fifteen grains (Troy). Had it been discovered in a cultivated state, and in a sheltered garden, I should not have been so much surprised. I add blossoms of the Gum Cistus, wall-flower, privet, &c., which I pulled on an open terrace, in my exposed sea-side garden this morning, although there was a smart hoar frost over-night. For the strawberry, I am indebted to Mr. W. Pengelly, the very able master of the Pestalozzian day-school, Torquay.

JOHN A. WALKER.

Cliff House, Torquay, Devon,
Nov. 26, 1844.

Note on the supposed Equisetum limosum of Linneus.

By EDWARD NEWMAN, F.L.S.

I HAVE received several letters respecting this plant, and much regret that I am still unable to give any satisfactory information respecting it. Mr. S. P. Woodward (Phytol. i. 878) speaks of an Irish Equisetum, as "in the hands of Mr. Newman to name;" and this perhaps has led some of the readers of the 'Phytologist' to anticipate seeing, in the pages of that work, a figure and description of an additional British species of Equisetum; but I have no materials in my hands that will enable me to decide whether this supposed species is really distinct from that already described under the name of *E. fluviatile*. The facts of the case are these: when giving a good deal of attention to the interesting task of discriminating the confused species of *Lastræa*, I wrote to Dr. Taylor, hoping that specimens from his neighbourhood, and his excellent judgment, might throw some light on the subject. In the letter containing Dr. Taylor's reply were contained fragments of a large Equisetum, but

so shattered that I could make little of them : those who may have entrusted well dried *Equiseta* to the tender care of the post-office, may in some measure imagine how they would travel from Dunkerron to London in a thin sheet of letter paper. When Mr. S. P. Woodward was on the botanical tour, an account of which was subsequently published in the 'Phytologist,' he visited Dr. Taylor, and procured more perfect specimens of the plant—and these he has since obligingly shown me. From an examination of them, I entertain much doubt whether they are strictly identical with the true *E. fluviatile*, so common about London, but as yet I am not in possession of characters whereby to separate the two as species. I learn that this *Equisetum* grows in boggy ground, on the hills, in the neighbourhood of Dunkerron, in such vast abundance, as to be cut and made into ricks, as winter fodder for cattle. At the time of Mr. Woodward's visit to Dunkerron, he saw several of these ricks. I am told that the stem is always simple, *i. e.*, without branches, and that the plant does not grow in the water, which the *Equisetum fluviatile* of Linneus, whether branched or unbranched, certainly does.

I had no knowledge of this Irish plant until after I had printed that portion of my 'History of British Ferns,' in which the *Equisetaceæ* are described ; yet meagre as was my information respecting it, I could not pass it by when completing the Synopsis, which, although placed in the work before the descriptions, was written and printed last of all : a notice of the plant was therefore introduced—I confess a most vague and unsatisfactory one, but it communicated all I knew then, and all that I know up to the present hour. I am induced to recur to the subject on the present occasion, because in the review of my 'History of British Ferns,' which has just appeared in the 'Annals,' and for which I feel much indebted to the author (whom I presume to be Mr. Babington), this *Equisetum* is again brought under notice. "Before proceeding," says the reviewer, "we may state that Fries distinguishes the two Linnæan plants, saying of *E. limosum*, 'ramulis vagis lævibus vaginis viridi-dentatis' and of *E. fluviatile* 'vaginis ramul. atris' (H. Scan. 155) ; he considers both of them as more or less constantly branching, nor can we agree with Mr. Newman's observation (at page 7), that the *limosum* (Linn.) never branches. At that page he separates the unbranched form of the British *E. limosum* from *E. fluviatile*, but does not characterize it, only stating, we think, incorrectly, that it 'never, under any circumstances, becomes branched.'" The state of the case is this, at page 51, I figure and describe a very common species of *Equisetum*,

which is clearly identical with the *Equisetum fluviatile* of Linneus. This species is generally branched, but it is impossible to examine any number of stems without finding a considerable portion unbranched. These unbranched stems I supposed to be the *Equisetum limosum* of Linneus; but before writing the Synopsis, I met with the Irish plant, and the appearance of this was so dissimilar, that I thought it *might* be a species, and *perhaps* the Linnean species *limosum*, so I retracted the opinion previously expressed, that the Linnean *limosum* was the unbranched form of the common *fluviatile*, since the new plant answered his description equally well, and had much more appearance of being distinct from *E. fluviatile*; from the description handed by my correspondents, I was able to say that the new plant "*appears* to grow at a greater elevation, to prefer boggy or muddy localities to actual water, and never under any circumstances to become branched." The reviewer, in this instance, by altering the wording, quite alters my meaning, and makes me speak *positively* of a fact of which I had no *positive* knowledge. The reviewer, in saying that I separate "the unbranched form, &c.," quite mistakes my intention: the London ditch plant is either branched or unbranched, both kinds of stem growing from one rhizoma: I never thought of separating these. The Dunkerron plant may also be branched or unbranched, but I only see it and hear of it as unbranched; it is this Dunkerron plant that I separate, and not the unbranched form of the London plant. When I supposed that the unbranched form of the London plant was the *limosum* of Linneus, I treated it as a mere casualty, and still think I was justified in doing so; but when I receive examples of a second plant, differing in habitat and in several characters, I think it *possible* I may have a second species, and do not unite it with either the branched or unbranched form of the London plant.

EDWARD NEWMAN.

Botanical Society of London.

November 1, 1844.—J. Reynolds, Esq., Treasurer, in the chair. Read, "Notice of the discovery of *Galium Vaillantii*, near Saffron Waldon, Essex," by G. S. Gibson, Esq. Specimens were presented. (See 'Phytol.' i. 1123).

November 29, 1844.—Eighth Anniversary Meeting; J. E. Gray, Esq., F.R.S., President, in the chair. From the Report of the Council it appeared that 17 members had been elected since the last Anniversary, and that the Society now consisted of 173 members. The

Report of the Herbarium Committee for the year ending 29th Nov. 1844, was read.

The Reports were unanimously adopted ; after which a ballot took place for the Council for the ensuing year, when the Chairman was re-elected President, and he nominated Edward Doubleday, Esq., F.L.S., and Dr. Bossey, Vice-Presidents ; Mr. F. Barham, Dr. Cooke, F.L.S., and Mr. S. P. Woodward, were elected new Members of the Council, and Mr. J. Reynolds, Mr. G. E. Dennes, and Mr. T. Sansom, were respectively re-elected, Treasurer, Secretary, and Librarian.

The Report of the Herbarium Committee embodies a general sketch of the Society's present condition, in its scientific departments, and runs thus : —

In presenting their Report for the present year, the Herbarium Committee may congratulate the Society on the favourable progress made in those departments which come more immediately under the superintendence of the Committee ; and upon which the efficiency of the Society, and its estimation before the public, are so materially dependant.

Exchange of British Specimens.—Although other objects were contemplated on the first institution of the Society, and some of these have been carried into effect as far as practicable, yet it has always been considered that the Society's highest utility would be found in the exchange of specimens, and improving the private herbaria of members by the distribution of new or local plants. The attention of the Committee has been sedulously devoted to this object ; and great assistance has been given by the ready kindness of members, in sending supplies of newly discovered, or otherwise interesting, plants : the specimens of which have been promptly and regularly distributed to the other members who required them. Varieties even of common species, have likewise been distributed, whenever obtained, since changes from their ordinary characters often bear importantly on the practical distinction of species. In addition, several current errors in nomenclature have been corrected, by the distribution of specimens collected and labelled expressly for this purpose. These novelties, &c., have been latterly enclosed to members, along with the specimens marked as their desiderata in the Edinburgh Catalogue, which could not include them. But as the London Catalogue of British Plants, lately printed for the Society, included all discoveries announced up to the end of 1843, the members will now be enabled to apply for past novelties and varieties in the usual manner, by drawing a short horizontal mark against the numbers which pre-

cede their names in the new catalogue. Already, however, additions and corrections require to be made to that new catalogue; examples of which will continue to be sent to the members (although not specially asked for) as the specimens can be procured. It unfortunately happens that the Society's Anniversary occurs at a period of the year which is most inconvenient for the Herbarium Committee to make their report. It is precisely the time when fresh parcels are coming in, with the results of the summer labours of collectors; although too early for any examination of their contents to have been made. Still, it may be observed, that the specimens already received, or promised, are sufficient to warrant an opinion on the part of the Committee, that there will be a very good stock of duplicates for distribution early in 1845, including many valuable specimens. It is not deemed necessary to lengthen the present Report, by any detailed enumeration of the species; they will be seen and estimated by the members who receive them from the Society. But the Committee feel justified in observing, that the circulation of specimens through the Botanical Society, is truly the very best method for making known new discoveries, and correcting errors of nomenclature: By this step, the discovery or correction is promptly placed before the eyes of numerous active botanists, in the best possible form—that of actual specimens in proof of its reality or truth. While the unvarying regularity of distribution, which has hitherto so peculiarly and exclusively distinguished the Botanical Society of London, affords a strong additional inducement for making this Society the general centre of inter-communication between the botanists of Britain. The Committee are well aware (and would by no means wish to conceal the fact), that in the few first years of the Society's existence, from 1836 to 1840, the system of labelling and distributing the specimens was very faulty. At the present time, with increased experience, and improved arrangements, in this respect, it is believed that the Society's labels and specimens may now be safely appealed to in questions of nomenclature; though liable, no doubt, to the imperfections of science, at any single period, as well as to those occasional inadvertencies which may occur in the labelling of many thousand of specimens. Since the last Report of the Committee, parcels have been received from W. Andrews, Dr. Ayres, T. Bentall, Rev. A. Bloxam, T. Clarke, Rev. W. R. Crotch, Dr. Dewar, R. Embleton, G. Fitt, G. S. Gibson, J. Gibson, J. E. Gray, E. Harvey, T. Ingall, E. Lees, M. Muggridge, J. T. Mackay, D. Moore, W. L. Notcutt, E. Palmer, J. Ray, R. Ranking, J. D. Salmon, Dr. Streeten, Mrs. Stoven,

D. Stock, J. Storey, J. Tatham, G. H. K. Thwaites, H. C. Watson, B. D. Wardale, S. P. Woodward, and Dr. Young : and return parcels have been sent to W. Andrews, Dr. Ayres, R. Embleton, G. S. Gibson, J. Gibson, J. E. Gray, E. Harvey, T. C. Hunt, R. Ranking, E. Palmer, Dr. Martius, Dr. Streeten, J. Ray, D. Stock, Mrs. Stoven, Dr. G. Watson, R. Kelvington, G. H. K. Thwaites, J. Tatham, and S. P. Woodward.

Exchange of Foreign Plants.—The limited finances of the Society have hitherto prevented the engagement of a Curator sufficiently conversant with Botany, for the labelling of foreign specimens. Nor, indeed, have more than very few of the members expressed any wish to be supplied with exotic plants. Small packets of specimens from the following countries can now be distributed; namely, Europe, Azores (Watson and Hunt), New South Wales (Anderson and others), New Zealand (Allan Cunningham), Norfolk Island and New Zealand Ferns (A. Cunningham). It is expected that sets of North American plants (Gavin Watson, and Kelvington), will be ready in the course of 1845. But the Committee will not venture to promise, that the tropical plants (East Indies, &c.), can be got ready within the next twelve months.

British Herbarium.—Under the active exertions of the Secretary, (who promptly solicits examples of new and interesting plants, for the use of the Society), the Reference Herbarium of British plants has received many valuable additions, which have been, or will be, duly announced, in the Reports of the Society's monthly meetings, published in the 'Phytologist,' and other periodicals.

Among others, the following may be particularly mentioned :—*Spergula stricta*, presented by Mr. G. S. Gibson; *Carduus setosus*, by Dr. Dewar; *Teucrium Botrys*, by Mr. T. Ingall; *Oenanthe fluviatilis*, by Mr. Bentall; *Galium Vaillantii*, by Mr. G. S. Gibson, new to England, although another form of the same species was long ago reported in Scotland, by G. Don; *Bromus commutatus*, var. *pubens*, by Mr. H. C. Watson. And in addition to these novelties, the Committee have to record their thanks to Mr. Edwin Lees, for a nearly complete set of British fruticose Rubi.

Foreign Herbarium.—The progress of a general Herbarium has been checked by the same circumstance which has interfered with the exchange of foreign plants; and the Committee feel that the formation of a good general Herbarium cannot be expected for the present. At the same time, it may be stated, that some tardiness in this respect is the less to be regretted; since the Committee have

reason for believing, that a good private collection, already including many thousands of species, and still rapidly increasing, will eventually come into the possession of the Society.

Cryptogamic Collections.—Numerous important additions to this department of the Society's Herbarium have been made during the year, chiefly by the following gentlemen; namely, Messrs. Gray, Thwaites, Bowerbank, Stephens, Dennes, Fordham, Beezley, Riley, Jackson, Gardiner, Merrick, Sidney, Muggridge, Sidebotham, Ibbotson, Hollings, Croall, Torry, and Sansom. To Dr. Ayres, and Mr. H. O. Stephens, the Committee are indebted for many valuable specimens of Fungi. And to Mr. Bowerbank, for a collection of Algæ, from the African coast, at Algoa Bay.

Local Herbaria.—The Herbarium of Thame, in Oxfordshire, has been completed by Dr. Ayres. A portion of that for Embleton, in Northumberland, has been presented by Mr. Embleton. That of Esher, in Surrey, has been collected by Mr. Watson, but is not yet fastened to paper. Mr. Salmon has commenced one for the neighbourhood of Godalming, in the same county. The Rev. W. R. Crotch is forming one for the neighbourhood of Taunton, in Somersetshire.

December 6, 1844.—J. Reynolds, Esq., Treasurer, in the chair. Dr. Dewar presented specimens of *Carduus setosus*, discovered by himself, in July last, three miles from Dumfermline, Fifeshire. This being a plant of Eastern Europe, and apparently hitherto unknown on the western coasts, there seems much probability that the seed has been accidentally imported from Russia. Its nearest ally in Britain is *C. arvensis*. Mr. Thomas Bentall presented specimens of *Cœnanthe fluviatilis* (of Coleman), collected by himself, in the river, near Halstead, Essex, in July.

The Rev. W. R. Crotch presented specimens of *Helianthemum Breweri* (*Planchon*), collected in the long-known locality of Holyhead Mountain, Anglesea. This species has hitherto been confounded with *H. guttatum*, by all British botanists; but is figured as an undescribed species in the 'London Journal of Botany,' for November, 1844, and explanations given in the succeeding number of the same periodical.

The true *H. guttatum*, from the south of France, was shown to be quite a different plant, by specimens laid before the Society.

Mr. Hewett Watson called the attention of the Society to a series of specimens, in illustration of the three species of *Cœnanthe* described by Mr. Ball, in the 'Annals of Natural History,' under the

names of *pimpinelloides*, *Lachenalii*, and *silaifolia*. Mr. Watson stated that these species had been confused and misnamed by Hudson and Smith, and that most succeeding botanists had in consequence been misled about them; the errors and confusion being greatly increased by the want of root and fruit, on specimens collected for herbaria. He considered that Mr. Lees was the first English botanist who correctly understood the true *pimpinelloides*. Mr. Babington next rightly determined the *Lachenalii*. And lastly, Mr. Ball, contrasting these two plants with the *peucedanifolia* of Smith, showed clearly enough that three indigenous species had been confused into two only, on account of no single botanist being sufficiently acquainted with all three. Specimens sent to the Society by the Rev. A. Bloxam, Mr. Lees, Mr. G. S. Gibson, and Mr. Thwaites, with others collected by Mr. Watson himself, illustrated the three species clearly; except that the early radical leaves, and perfectly mature fruit, of Smith's *peucedanifolia*; were still wanting. Mr. Watson, however, suspected that Mr. Ball's name of *silaifolia* was equally incorrect as Smith's name of *peucedanifolia*; and not knowing any other described species to which Smith's plant could be referred, he adopted the name of *CEnanthe Smithii*; to be temporary or permanent, as occasion might require. Having sent a paper to the 'Phytologist,' on the subject, he would not extend his remarks further before the Society. The following is an abbreviation of the specific characters proposed for the species:—

1. *C. pimpinelloides*, Linn. Tubers oval or sub-spherical, connected with the stem by a slender peduncle. Fruit cylindrical, about as broad as the calyx, callous at the base, not contracted.

2. *C. Lachenalii*, Gmel. Tubers elongated and slender, clavate, fusiform, or subcylindrical, gradually enlarging from the base of the stem, without any distinct peduncle. Fruit oblong or turbinate, broader than the calyx, contracted and without callosity at base.

3. *C. Smithii*, H. Wats. Tubers short and thick, clavate, fusiform, or oblong, sessile at the base of the stem. Fruit cylindrical, scarcely so broad as the calyx, callous at the base, not contracted.

The Society has specimens of these three species for distribution, but those of *pimpinelloides* and *Smithii* are, unfortunately, few in number, and by no means in good condition. So long as they will last, examples will be introduced into each parcel, sent out in rotation, in order to correct errors of nomenclature, which may be expected in most British herbaria.—G. E. D.

Notes on a Botanical Tour in Germany.

By JOSEPH WOODS, Esq., F.L.S.

(Continued from page 21).

On the 6th, I again rambled in the woods without adding much to my former observations. *Thesium intermedium* of Koch, is very common along the Rhine, and is, I believe, what we in England call *T. linophyllum*. I here added *T. pratense*, which differs very distinctly both in the calyx of the fruit, and in the root. *Cystea fragilis* and *Polypodium Dryopteris* are common, but I was surprised to meet with *P. Phegopteris* on the dry banks. I followed a little brawling stream down to the valley beyond Hardenburg, but it gave me nothing. Such a brook would have had more interest in England. At Hardenburg there are some very fine ruins of a noble castle. *Tetragonolobus siliculosus* was growing on some boggy ground in another place. I walked on the 7th as far as Maxdorf, a village nearly half way to Mannheim: I had been shown, on a former occasion, a meadow full of *Dianthus superbus* and *Gentiana Pneumonanthe*, and I was desirous of seeing if it would not yield something at an earlier season. I found there *Gentiana utriculosa* and *Polygala amara*. A little nearer to Dürkheim grows *Carex hornschurchiana*. Koch, in his 'Taschenbuch,' seems to have given up the distinction of the roots between this and *C. fulva*, and to depend on other characters, which, however, are not very satisfactory; the principal being the comparative length of the sheathing leaves. I did not see on the hills at Dürkheim, either *Trifolium alpestre* or *montanum*, both of which are common hill-plants further down the Rhine, but they both appear in this low sandy district, as does also *Arnica montana*.

After leaving Dürkheim, I botanized at Heidelberg, on the 10th and 11th. The immediate neighbourhood is not rich. I gathered *Chærophyllum aureum* and *Thesium montanum*, under the direction of Professor Bischoff. *Spiræa Aruncus* is common in the woods, and *Bromus inermis* by the way side. On the 12th, I had a walk to Heilbronn, on the "bunter sandstein," east of the town. A little cliff separates the vineyards from the woodland. It seems as if some beds of a schistose nature formed a useful soil for the vines, and these being dug out, have left a perpendicular cliff: all below is vineyard, all above thicket. We have therefore none of those ambiguous banks between the two, which often afford such favourable situations. I got *Iris sambucina* (plentiful in some places on the banks between the

vineyards, just below the woods), and *Rosa gallica* sparingly; *Crepis præmorsa* also occurred, but the variety of plants was small. West of the town, my map says that the hills are of limestone, but the forest in that direction is farther off. On going to Nuremberg, *Lychnis viscaria* shows itself by the road side; and I noticed *Berteroa incana*, which afterwards became very common.

On the 15th, I spent some time with Professor Koch, in the botanical garden, which contains a good collection of German plants; and in the afternoon, had a botanical walk with the gardener, whom Koch sent with me, and with Mr. Schnitzlein, a good botanist, and the author of a work with figures to explain the natural orders of plants. Our walk lay chiefly in that part of an extensive forest of pines, which lies to the west of the road to Nuremberg, and which advances to within a mile of Erlangen, and some adjoining moist meadow lands. The soil is everywhere sand. In the woods it is also the moist parts which are most productive. The drier parts are almost covered with *Vaccinium Vitis-idæa*, now in flower. Our plants were *Polygala amara*, *Sedum villosum*, *Trifolium hybridum* (*Koch*), *Chærophyllum hirsutum*, *Hieracium præaltum*, var. *fallax*, *Poa sudetica*, *Carex davalliana* and *brizoides*, and *Orchis angustifolia*. *Orchis latifolia* grows in the same places; and here the eye readily learns to distinguish them: but as I have already observed, their forms must be traced in different localities before we can fully decide as to their specific distinction. In some meadows on the other side of the little river, the next day I gathered *Erysimum strictum*, under the guidance of Professor Hoffrath Koch, and we saw also plants of *Chærophyllum bulbosum*, and *Rumex maximus*, but neither of them approaching to flowering. Koch's knowledge of species, and readiness with their minute characteristics, is wonderful; he seems to have everything of the sort at his finger's ends. He is now publishing an enlarged edition of his 'Synopsis,' but I am afraid is rather too ready to multiply the number of species. The sandy hills behind Erlangen offered me *Dianthus deltoides*, *Trifolium spadiceum*, *Vicia tenuifolia*, *V. villosa*, var. *glabra*, *Lathyrus tuberosus*, *Pyrola secunda* and *rotundifolia*, *Caucalis latifolia*, *Eriophorum vaginatum*. The 18th and 19th of June were spent in an excursion to Muggendorf, and I was very sorry when I saw the place, that I had not dedicated to it a longer time. The country is of the Jura limestone, intersected with very narrow rocky valleys, richly adorned with wood, and each watered by its own bright beautiful stream.

The following plants were collected in this locality: —

<i>Anemone sylvestris</i>	<i>Rosa rubiginosa</i> , the fruit	<i>Asarum europæum</i> , com-
<i>Actæa spicata</i>	always smooth	mon
<i>Draba aizoides</i>	<i>Spiræa Aruncus</i>	<i>Physalis Alkekengi</i> , abund
<i>Alyssum saxatile</i> , by the	<i>Peucedanum Oreoselinum</i>	
Great Miller's Hole;	<i>Laserpitium latifolium</i>	<i>Teucrium Botrys</i>
but even the seeds had	<i>Chærophyllum aureum</i>	<i>Ajuga Chamæpitys</i>
for the most part dis-	<i>Galium boreale</i>	<i>Orchis militaris</i>
appeared	<i>Sambucus racemosa</i>	<i>Ophrys Nidus-Avis</i>
<i>Erysimum odoratum</i>	<i>Leontodon incanum</i>	<i>Cephalanthera pallens</i>
<i>E. crepidifolium</i>	<i>Hieracium præaltum</i>	<i>C. rubra</i>
<i>Polygala amara</i> , on dry	<i>Crepis præmorsa</i>	<i>Epipactis rubiginosa</i>
banks	<i>Chrysanthemum corymbo-</i>	<i>Lilium Martagon</i>
<i>Orobus vernus</i>	sum	<i>Sesleria cærulea</i>
<i>Vicia sylvatica</i>	<i>Carduus defloratus</i>	<i>Polypodium calcareum</i>
<i>Fragaria elatior</i>	<i>Pyrola rotundifolia</i>	<i>Cystopteris fragilis</i>
<i>Rubus saxatilis</i>	<i>P. secunda</i>	

Erysimum odoratum and *crepidifolium* are very nearly allied, and as here found, both smell equally sweet. Even the character depended upon by Koch—the smooth angles of the pod in the first-named species, is not to be taken without some allowance; and in the last, as exhibited at Muggendorf, the angular nerve is sometimes greener and less hairy than the flat faces of the pod. The specimens from Kreuznach seem to exhibit this character more absolutely, and I should have been inclined to doubt whether all my Muggendorf plants did not belong to *E. odoratum*, if Koch had not called them *crepidifolium*.

Erlangen will shortly be very accessible to the English traveller, as the rail-road now in progress from Bamberg to Augsburg passes through it. There are steam-boats from Frankfort to Würzburg, so that the only part of the journey to be performed in the slow old-fashioned plan is from Würzburg to Bamberg, and this I think cannot continue long. They talk of a rail-road from Nuremberg to Ratisbon. There is already a canal.

From Erlangen to Neumarkt the soil is sandy, nearly level, and abounding in pine-forests. Beyond Neumarkt (where there is an excellent inn), we got upon hills of the Jura limestone, and there are a few beautiful spots, and tempting slopes, which the botanist would like to examine; but on the whole, it is a country of little interest till we descend towards the Danube and approach Ratisbon, where some very beautiful valleys reminded me of Muggendorf. Above Ratisbon, and on one side also of the Danube, for two or three miles below, the valley is bounded by rocky hills of the Jura limestone, on

which we find *Clematis recta*, *Viola mirabilis*, *Polygala Chamæbuxus*, *Arenaria fastigiata*, *Cytisus ratisbonensis* and *nigricans*, *Lathyrus heterophyllus*, *Rosa gallica*, *Rosa cinnamomea*, *Rubus saxatilis*, *Astrantia major*, *Chærophyllum bulbosum*, *Crepis præmorsa* and *alpestris*, *Lactuca perennis*, *Centaurea paniculata*, *Cerinth minor*, *Orobanche cærulescens*, *Cypripedium Calceolus* (unfortunately for me) entirely out of flower: *Euphorbia verrucosa* is common everywhere; *Alnus incana* by the river side, *Anthemis austriaca* among the corn of the valley; *Gypsophila saxifraga*, on dry banks; *Erica carnea* in the woods; the only *Erica* here. I missed *Thesium rostratum*, *Potentilla opaca* and *Hierochloe australis*, all of which I ought to have found at the Schutz Felsen, so named, I believe, by Hopper, on account of the hollows with which the rocks abound, and which would give shelter to the botanist in all weathers. They are limestone rocks on the banks of the Danube. The great extent of the country about Ratisbon belongs to the green-sand formation. *Pyrola secunda* is here very common in the forest; *P. minor*, less so; *P. chlorantha*, scarce. Below Ratisbon, on the left bank, we come to granitic hills, on one of which stands the magnificent Walhalla. The Walhalla, as everybody knows, is a Grecian temple, imitated from the Parthenon, and placed on the top of a succession of lofty-terraced walls, which at present are rather obtrusive. The inside is adorned with the busts of the great men of Teutonic race, of all ages; but we look in vain among them for that of Luther. On these hills I gathered *Cytisus capitatus*, and on the foot of the Walhallaberg, *Stenactis annua* and *Physalis Alkekengi*.

Great part of the road from Ratisbon to Munich was passed in the night, but it seems to be particularly without interest; only as we approached the latter place, the towering ranges of the Alps come into view. The botanical points near Munich are—First, the banks of the Isar, which brings down with it several mountain plants; and which, above Harlack, two miles above Munich, begin to be bold and rocky. On the gravel of the river, and the adjoining thickets, we find *Thalictrum aquilegifolium*, *Æthionema saxatilis*, *Polygala amara*, *Gypsophila repens*, *Myricaria germanica*, *Astrantia major*, *Galium boreale*, *Hieracium staticifolium*, *Gentiana cruciata*, *G. Asclepiadea*, *Salix incana* and *Arundo littorea*. On the gravelly banks above, and quite free from any present action of the river, we have *Biscutella lævigata*, *Dianthus cæsius*, *Saxifraga mutata*, *Leontodon incanum*, *Arbutus Uva-ursi*, *Erica carnea*, *Orchis odoratissima*, *Herminium monorchis* and *Tofieldia palustris*, a very common plant about Munich.

Secondly. Certain tracts of bog or boggy pasture, only one of which I visited ; and here, and on the low ground in the way to it, it is curious to observe the union of different plants, which in England we are not at all accustomed to see or to expect together. *Tofieldia palustris* and *Primula farinosa* do not seem to require bog, but grow in close companionship with *Dianthus superbus* and *D. Carthusianorum*. Hardly separate from these we find *Pinguicula officinalis*, and, I believe, *P. alpina* ; but of course there were neither flowers nor seeds. *Polygala amara* is also here, *Gentiana verna*, and *cruciata*. In the more complete bog (which is very superficial) we have *Primula villosa*, *Pedicularis sceptrum*, *Gentiana utriculosa*, *Schoenus nigricans* and *S. ferrugineus*, *Utricularia minor*. *Salvia verticillata* and *Bromus inermis* are common almost everywhere. I gathered also on my way to the bog, at Ludwigs-feld, *Arenaria fastigiata* and *Teucrium montanum* ; and on the other side of the Isar, *Hypochæris helvetica* and *Orchis Coriophora*. *Arnica montana* and *Cirsium bulbosum* are common in moist places.

It may be supposed that I did not leave Munich without seeing some of the wonders of art for which it is now so celebrated. The frescoes, on the whole, disappointed me : those of Hess, now in progress in the Basilica, pleased me best ; and here the story is well told, and the figures graceful and spirited. The colouring, too, is often good, and the relief perfect. In architecture, a little chapel attached to the palace is a perfect jewel, in what is called here the Byzantine style, which is nearly allied to our Norman. The ground is gold, with figures of saints and angels, and the columns of a fine dark marble. The whole effect is exceedingly rich and beautiful, and the chastened light (we do not see the windows from the body of the church) shows to great advantage a style of finish, which, when seen in the full daylight, is apt to be rather glaring. The Ludwig's kirche and the Au kirche are also beautiful buildings, and might be taken as types of the German gothic at two different periods. The nineteen painted glass windows of the latter, each of which is said to have cost £1200, are very much admired. The Basilica also is probably a more perfect example of its style than any of the ancient ones now existing, and promises to be a building of a very high character of beauty. Sixty-six noble columns, each of one piece of marble, adorn the interior. In the endeavour to imitate classic antiquity, the artists have, I think, been less successful. The Glyptotheca, and Pinacotheca are spacious buildings well suited to their purpose, but not possessing any striking character. The library, and some other buildings, are imitations of

the Florentine style, and not very happy ; but a copy of the Loggie of Orcagna, at the end of the Ludwig's strasse, makes a very fine object, and altogether, the Ludwig's strasse itself is a magnificent or perhaps unrivalled entrance to the city. The buildings on both sides are on a grand scale, and though some of them may individually be open to criticism, yet their defects are lost in the impressive magnificence of the whole.

From Munich I went to Passau, a very uninteresting ride, and it is not till we approach the latter place that the botanist observes any spot on which he would like to spend an hour or two, except perhaps the Erdinger moss, where we first met with it, at Kirchheim—a dreary place, where only a botanist could find anything inviting. At Passau we are quite in a different country. The banks of the Danube are steep and rocky, with small valleys opening into the larger. I walked up the banks of the Inn, where *Arundo littorea* is abundant, and where I got also *Geranium palustre* ; I then turned into the forest ; I observed what I believe is *Arundo stricta*, in small quantity, and not yet in flower. *Soldanella montana*, alas ! out of flower, but very abundant. The next day I crossed the Danube, and walked up the sweet valley of the IIs, which winds remarkably between steep and often rocky banks, as it approaches the Danube. It was rather above this beautiful part, on a side valley, that I met with some spongy meadows, which furnished, besides many things now too familiar to mention, an umbellate plant hardly in flower, which I have not yet determined, and *Juncus filiformis*. The woods in this direction gave me little, and I could not discover a single plant of *Soldanella montana*. Yet the soil is, I believe, alike granite on both sides of the river. In a boggy spot in the woods I observed *Trientalis europæa* ; *Digitalis grandiflora* is found in some of the sloping banks below the woods. *Carex davalliana* occurs occasionally. *Berteroa incana* and *Spiræa Aruncus* are very common.

From Passau I descended the Danube to Vienna, the first day in a continued rain, the second with intervals of fine weather. The banks are less magnificent and romantic than those of the Rhine, and want, in great measure, the charms of the numerous castles which adorn the latter river. But they are more varied and graceful in their forms, and with much more and better wood. Nothing can be finer than the way in which the hills are broken in the openings of some of the lateral valleys, or more tempting to a botanist. The staple conversation in the steam-boats, is the superiority of the Danube to the Rhine. I found that the relation on whose account chiefly I had

prolonged my journey as far as Vienna, had established himself for the present at a village about ten miles distant. Thither I proceeded. The place, Kaltenleutgeben, is seated in a small valley among limestone hills, a very pleasant place, and abounding in good plants. I took the rail-road to a village called Leising, and there hired a sort of cart, made of basket work, with a seat upon springs. On the way we found *Lepidium Draba*, *Astragalus onobrychioides*, and *A. cicer*. *Lathyrus tuberosus*, *Dipsacus laciniatus*, not in flower; *Salvia sylvestris*, *Verbascum phlomoides*, *Linaria genistifolia*. And in my walks about the place, I added:—

<i>Æthionema saxatilis</i>	<i>Knautia sylvatica</i>	<i>Verbascum orientale</i>
<i>Polygala major</i>	<i>Leontodon incanum</i>	<i>Epipactis microphylla</i>
P. <i>Chamæbuxus</i> , in fruit	<i>Anthemis austriaca</i>	<i>Cypripedium Calceolus</i> , out of flower
<i>Gypsophila saxifraga</i>	<i>Cirsium pannonicum</i>	<i>Lilium Martagon</i>
<i>Coronilla Emerus</i> , and <i>C. montana</i> , both in fruit	<i>Nonea pulla</i>	<i>Veratrum album</i> and <i>V. nigrum</i> , not yet in flower.
<i>Dorycnium fruticosum</i>	<i>Stachys alpina</i>	And afterwards, on a second visit
<i>Orobancha fruticosa</i>	<i>Melampyrum nemorosum</i>	<i>Seseli Hippomarathrum</i>
<i>Orobancha fruticosa</i>	<i>Orobancha cruenta</i>	<i>Inula ensifolia</i>
<i>Orobancha fruticosa</i>	<i>Teucrium montanum</i>	<i>Globularia cordifolia</i> and <i>Sideritis montana</i>
<i>Orobancha fruticosa</i>	<i>Asarum europæum</i> , quite over	
<i>Vicia cassubica</i>	<i>Cyclamen europæum</i>	
<i>Potentilla recta</i>	<i>Lysimachia punctata</i>	
P. <i>inclinata</i> ?		

I went twice from Vienna to a place called the Brigittenau, forming part of one of the islands of the Danube. The place is of little interest in itself, but is said to be the station of some rare plants. I was not successful, and found nothing but what is common about Vienna, except *Veronica austriaca*, in seed. *Podospermum Jacquini* is abundant, and so is *Atriplex nitens*, but not yet in flower, and an *Atriplex* is of little value without the seed. *Viola elatior*, *Potentilla opaca*, *Corispermum nitidum*, *Euphorbia palustris*, *Naias minor*, *Cyperus flavescens*, *Poa fertilis*, are among the plants enumerated. A more interesting place is the Turken Schänze, where the Turks are said to have pitched their camp, in the memorable siege of Vienna, in 1683. One does not see why they should have tossed the ground about in such an irregular manner. We enjoy from this place a very fine view of Vienna. The soil is sandy. I found here, *Hieracium echinoides*, *Linaria genistifolia*, *Stipa pennata*, *Scabiosa suaveolens*, *Campanula sibirica* (out of flower), *Euphrasia lutea* (not yet in flower). This forms a very small portion of the riches of this locality.

Here are said to grow —

<i>Anemone pratensis</i>	<i>Potentilla cinerea</i>	<i>Thesium ramosum</i>
<i>Alyssum minimum</i>	<i>Helichrysum arenarium</i>	<i>T. divaricatum</i>
<i>Gypsophila paniculata</i>	<i>Serratula mollis</i>	<i>Gagea pusilla</i>
<i>Linum hirsutum</i>	<i>Scorzonera austriaca</i>	<i>Carex stenophylla</i>
<i>Cytisus biflorus</i>	<i>Hieracium bifurcum</i>	<i>C. schœnoides</i>
<i>Prunus chamæcerasus</i>	<i>Orobanche cærulescens</i>	<i>C. supina</i>
<i>Potentilla Güntheri</i>	<i>Salvia austriaca</i>	<i>C. nitida</i>

Besides many other plants interesting to a western botanist.

I did not botanize on the north of the Danube. On the south we may consider the neighbourhood of Vienna, as to its Botany, under four heads. The first comprises the corn-fields and way-sides; the glaci; the Türken Schänze, and some other little bits of uncultivated land separated from the river; and within a mile or two of the suburbs. Here, besides the plants already enumerated on the Türken Schänze, and many of those on the Brigettenau, grow —

<i>Ceratocephalus falcatus</i>	<i>Myagrum perfoliatum</i>	<i>Astragalus asper</i>
<i>C. orthoceras</i>	<i>Polygala comosa</i>	<i>Caulalis intricata</i>
<i>Arabis Gerardi</i>	<i>Potentilla supina</i>	<i>Saxifraga bulbifera</i>
<i>Sisymbrium Lœselii</i>	<i>P. inclinata</i>	<i>Inula britannica</i>
<i>Erysimum repandum</i>	<i>Linum austriacum</i>	<i>Echinops sphærocephalus</i>
<i>E. virgatum</i>	<i>Silene dichotoma</i>	<i>Bryonia alba</i>
<i>Nasturtium austriacum</i>	<i>S. viscosa</i>	<i>Parietaria erecta</i>
<i>N. anceps</i>	<i>Stellaria viscida</i>	<i>Gagea arvensis</i>
<i>Syrenia angustifolia</i>	<i>Hibiscus Trionum</i>	<i>Euphorbia diffusa</i>
<i>Farsetia incana</i>	<i>Vicia pannonica</i>	<i>Scirpus radicans</i>
<i>Lepidium perfoliatum</i>	<i>Trigonella Fœnumgræcum</i>	<i>Bromus commutatus</i>
<i>Euclidium syriacum</i>	<i>Astragalus sulcatus</i>	<i>Lolium italicum</i>

Parietaria erecta is the only species noted as growing about Vienna. The *Lolium italicum* is the *L. Boucheanum* of the first edition of Koch's 'Synopsis,' and is beautifully distinguished from *L. perenne*, by the estivation of the leaves in the barren shoots. These are simply folded in the latter species, and rolled in, in the former. The number of the flowers, though generally forming a distinctive mark, is not quite constant, but the spike seems to be always more lax, and the spiculas more spreading.

The second chapter of Vienna Botany, is that of the shores and islands of the Danube, including the Prater and the Brigettenau. Here are to be added :—

<i>Galium pedemontanum</i>	<i>Cirsium nemorale</i>	<i>Ornithogalum nutans</i>
<i>Valeriana sambucifolia</i>	<i>Myosotis sparsiflora</i>	<i>Typha minima</i>
<i>Artemisia scoparia</i>	<i>Statice elongata</i>	

The third division is composed of the low lands, often somewhat boggy, extending towards the Neusiedler See. The most remarkable plants are : —

<i>Clematis integrifolia</i>	<i>Lavatera thuringiaca</i>	<i>Cirsium canum</i>
<i>Thalictrum Jacquinianum</i>	<i>Ononis hircina</i>	<i>Scutellaria hastifolia</i>
<i>T. galioides</i>	<i>Astragalus austriacus</i>	<i>Gladiolus Boucheanus</i>
<i>Lepidium crassifolium</i>	<i>Lythrum virgatum</i>	<i>Iris spuria</i>
<i>Viola stagnina</i>	<i>Bifora radians</i>	<i>I. graminea</i>
<i>V. Ruppii</i>	<i>Cirsium Chailletii</i>	<i>Allium acutangulum</i>
<i>Silene multiflora</i>	<i>C. tataricum</i>	<i>Scirpus radicans</i>

The fourth division consists of the range of limestone hills which extends from the Alps of Lower Austria quite to the neighbourhood of Vienna. The northern extremity is within the reach of a walk from Vienna; or the botanist may take advantage of one of the omnibuses which go to several villages in that direction, or to Nussdorf, the station of the steamers on the Danube. The Kahlenberg and the Leopoldsberg are the points most visited. In another direction, the Glocknitz railway will carry him to Medling, a post from which he may conveniently visit some of the best stations among the hills, and extend his rambles over the low country which forms my third division. The most interesting plants of this district, besides several of those already enumerated, are the following : —

<i>Anemone patens</i>	<i>Coronilla vaginalis</i>	<i>Centaurea axillaris</i>
<i>Adonis vernalis</i>	<i>Vicia pisiformis</i>	<i>Pyrola chlorantha</i>
<i>Helleborus dumetorum</i>	<i>Orobus vernus</i>	<i>Echinosperrum deflexum</i>
<i>H. niger</i>	<i>O. versicolor</i>	<i>Verbascum Schottianum</i>
<i>Eranthis hyemalis</i>	<i>Cotoneaster tomentosa</i>	<i>Verbascum pyramidale</i>
<i>Isopyrum thalictroides</i>	<i>Prunus chamæcerasus</i>	<i>Digitalis ferruginea</i>
<i>Delphinium elatum</i>	<i>Rosa turbinata</i>	<i>Glechoma hirsuta</i>
<i>Corydalis cava</i>	<i>Pyrus nivalis</i>	<i>Dracocephalum austriacum</i>
<i>C. fabacea</i>	<i>Sempervivum hirtum</i>	<i>Thesium ebracteatum</i>
<i>C. pumila</i>	<i>Seseli coloratum</i>	<i>Euphorbia angulata</i>
<i>C. solida</i>	<i>S. Hippomarathrum</i>	<i>E. fragifera</i>
<i>Arabis petræa</i>	<i>Peucedanum alsaticum</i>	<i>E. epithymum</i>
<i>Hesperis tristis</i>	<i>Torilis neglecta</i>	<i>Loranthus europæus</i>
<i>H. runcinata</i>	<i>Anthriscus trichosperma</i>	<i>Ulmus effusa</i>
<i>Sisymbrium pannonicum</i>	<i>Cephalaria transylvanica</i>	<i>Quercus Cerrhis</i>
<i>Erysimum austriacum</i>	<i>Inula hybrida</i>	<i>Orchis variegata</i>
<i>Viola mirabilis</i>	<i>I. squarrosa</i>	<i>O. sambucina</i>
<i>Dianthus plumarius</i>	<i>I. hirta</i>	<i>O. pallens</i>
<i>D. Seguieri</i>	<i>Artemisia austriaca</i>	<i>O. hircina</i>
<i>Euonymus verrucosus</i>	<i>Achillæa lanata</i>	<i>Ophrys arachnites</i>
<i>Rhus Cotinus</i>	<i>A. tanacetifolia</i>	<i>Limodorum abortivum</i>
<i>Dorycnium herbaceum</i>	<i>Carduus hamulosus</i>	<i>Epipactis microphylla</i>

Goodyera repens
Cephalanthera rubra

Cypripedium Calceolus
Allium flavum

Iris pumila
Veratrum Lobelianum

Perhaps for some of them the botanist will find it expedient to stop a day or two also at Baden.

(To be continued).

*On the re-discovery of Ray's Habitat for Malaxis paludosa at
Tonbridge Wells.* By JOHN SHARP, Esq.*

Tonbridge Wells, September 10, 1844.

Dear Sir,

It is with feelings of no ordinary kind that I communicate to you the rediscovery of a plant supposed by many to be lost (if indeed it were ever found) in the neighbourhood of Tonbridge Wells. Last August, as Mr. Woodward and myself rambled in the woods near Eridge rocks, till we came out of the grounds into a kind of grassy bog. Mr. Woodward, feeling fatigued by the excessive heat of the day, threw himself on a dry part, and remarked in a casual manner that *Neottia spiralis* grew there. As I was botanizing but a few yards off, I ran to him, and seeing the plant, shouted with a voice of rapture that it was *Malaxis paludosa*!

To an ardent admiration of Nature I have always added a great respect for those original minds who first gave to her beauties a systematic form. Foremost amongst these is Ray, a philosopher who lived at a period, certainly not of ignorance, yet still one in which the grossest absurdities were sent forth by men who were *called* scientific, who built their theories in their closets to account for phenomena which they never witnessed, and drew inductions from data which existed only in their imaginations. Although perhaps not wholly untouched by the speculative manner of the day, Ray became, in the pursuit of Natural History, a plain chronicler of facts, and faithfully recorded what he witnessed, and no more; thus rendering to science a far more important service than all those dreamers whose works now slumber in peace on the shelves of the curious. Thoughts such as these, indescribable but full of pleasure, caused my exultation. There was a plant before me, which an old and valued botanist had described as growing in this forest,—had probably found in this very spot,—more than a century and a half before, a plant long anxiously though fruitlessly sought after, and which Forster inserts in his 'Flora Tonbri-

* Addressed to and communicated by Edward Jenner, Esq. of Lewes.

gensis' solely on the authority of Ray, having himself sought for it in vain.

I cannot conclude my letter without adverting to a subject we have frequently discussed, — the shameful practice of destroying habitats. The specimens of *Malaxis paludosa* were not plentiful, the summer being very dry; I question whether they have ever been abundant: yet the plant has withstood the changes of a hundred and sixty or seventy seasons, a living witness of its great discoverer. It is painful to think that a time may come when rude hands may pluck it, exulting in the deed of gathering the last of Ray's plant. This is no exaggeration; a wretched doctrine is in force, that plants are better in the collections of the scientific, than left to perish on bogs and wastes.

I remain, Dear Sir,

Yours, &c.

JOHN SHARP.

Notes on some British Specimens, distributed by the Botanical Society of London, in 1844-5. By HEWETT C. WATSON, Esq., F.L.S.

INSERTION of the following explanatory notes, in reference to various specimens of British plants, distributed by the Botanical Society of London, is requested in the 'Phytologist.' As recorded facts, independently of the specimens, they will not be without interest or usefulness to botanists who are not members of the Society; besides giving to the members those explanations which could not be conveyed by the labels alone.

The Society has of late adopted the practice of including additional specimens in the parcels sent out to members, although not expressly asked for in lists of desiderata. This has been done in the case of newly discovered species or varieties, the names of which could not appear in Catalogues previously printed; as also in other instances, for the correction of errors, or for illustrating any change from the normal character of species. The Botanical Society of Edinburgh has just announced an intention of adopting one important feature from the London Society (although without the candour of acknowledging whence it has been copied); and it would be well for the rulers of that Society to take a second leaf out of the London volume, by adopting the practice here alluded to also.

The London Catalogue brings down the list of British plants to the

commencement of 1844; so that members can now apply for anything recorded as British up to that time, and there can be few actual novelties for the distribution of this winter. The species discovered in the summer of 1844, appear to have been collected very sparingly; and although specimens have been kindly presented to the herbarium of the Society, by Mr. Gibson, Mr. Tatham, Dr. Dewar, and other active botanists, they could not be supplied in quantity, as duplicates for general distribution. Hence, it will be seen, the additional specimens of this year are sent rather to illustrate variations of character, and clear away doubts or errors in nomenclature, than under the more attractive, though scarcely more important, claims of novelty.

1. *Œnanthe Lachenalii* (*Gmel.*), *pimpinelloides* (*Linn.*) and *peucedanifolia* (*Smith*). Ample explanations of these plants have been already communicated to the pages of the 'Phytologist,' (Phyt. ii. 11). Through the kindness of the Rev. A. Bloxam, Mr. G. S. Gibson and Mr. Fitt, an abundant supply of the first species was obtained. Of the other two species, the specimens are few, without mature fruit, and the roots of several are broken short or quite absent. Small packets of the fruits of *Œ. pimpinelloides*, taken from a garden plant, were added, in order to show its cylindrical form, without contraction at the base or summit; but these having been ripe, even to complete desiccation, when gathered, the callosity of the base is scarcely perceptible. While alluding to these plants, I may mention a further character for distinction between two of them. In *Œ. Lachenalii* the mucro of the leaflets is short and straight; while in *Œ. pimpinelloides* it is longer, more acute, and somewhat curved or hooked.

2. *Bromus commutatus* (*Schrad.*), var. *pubens*. This is simply a pubescent state of the species (Phytol. i. 1002), and may be expected to occur in any part of England. There has been, and still is, so much confusion about this species, that a wide distribution of authentic specimens is desirable. By Smith, it was confounded one while with *B. arvensis*, one while with the non-pubescent state of *B. mollis*, which is the variety "racemosus" of the London Catalogue. By the Edinburgh botanists, and some English ones, it has usually been labelled "*B. arvensis*;" but by the greater number of English botanists, perhaps, it is labelled "*B. racemosus*." Thus, no reliance can be placed upon any localities recorded for plants under either of these two latter names: usually we may expect to find *B. commutatus*.

3. *Primula elatior*, (*Jacq.*). Many specimens of this species were distributed in 1843 and 1844; and it was accordingly omitted from parcels made up shortly before Christmas, 1844. But a renewed dis-

tribution becomes desirable, as it appears that the Edinburgh Society are still (December, 1844) sending out the caulescent variety of *Primula vulgaris*, labelled as "*P. elatior*." It is but justice to the present Curator of that Society, however, to add, that the same and many other misnomers which occur in my parcel from Edinburgh, this winter, are on labels which bear the dates of preceding years: — but why still sent out uncorrected? Formerly, the Edinburgh Society's labels were much more accurate than those of the London Society: now, the balance seems quite reversed; though I fear this improvement will be only temporary in London, as it depends wholly on a single individual, who may not continue an active member much longer.

4. *Helianthemum Breweri*, (*Planch.*) This is the Holyhead plant, which has been so long confused with *H. guttatum*. But while it appears to be truly distinct from the latter, there seems a geographical improbability of a species being exclusively peculiar to a small part of Anglesea. (*Phytol.* ii. 23).

5. *Lastrea spinosa*, (*Newm.*) Usually passed over as a form of *L. dilatata*, (*L. multiflora*, *Newm.*) The specimens may be deemed authentic; two of them having been seen and named by Mr. Newman, before the rest were labelled.

6. *Scleranthus perennis*, (*Linn.*) This is distributed on the chance that some of the specimens may assist in correcting the very frequent error of labelling specimens of *S. annuus*, which are collected in winter or spring, with the name of the present species. About nine or ten of the specimens sent to me under the name of *S. perennis*, belong really to *S. annuus*.

7. *Linaria spartea*, (*Hoffmsg.*) Distributed last year, but not being in the London Catalogue, specimens may still be sent out while they last. In the past autumn (1844) there were many plants in the locality at Walton-station, to which it has doubtless been introduced by some chance. I am not able to say with confidence, whether this name, or that of *L. juncea* (*DeC.*) should be given to the specimens; but it is certainly the plant common in gardens, under the name of *Antirrhinum sparteum*.

8. *Polygonum maritimum*, (*Linn.*) Garden specimens, raised from foreign seeds, as shown on the labels. The inducement to send them in the parcels, is, that they are so intermediate between *P. maritimum* and *P. Raii* (*Bab.*), as to throw much doubt on the specific distinctness of these two species. It is worthy of note, that these garden specimens were referred to *P. Raii* by a well known Professor of Botany, who has had good opportunities for studying the latter in its

native localities. I believe that I should have done the same, if unaware that it was the descendant of *P. maritimum*, with which it agrees in its more nerved ochreæ; while in general habit, that is, in its long trailing branches and elongated internodes, it has a much stronger first-glance resemblance to *P. Raii*. Are a few more or less nerves in the ochreæ sufficient specific distinctions between plants which are otherwise scarcely if at all distinguishable? When I can procure ripe seeds of *P. Raii*, I will try how near that (species?) can be brought to *P. maritimum*.

9. *Melampyrum sylvaticum*, (*Linn.*) Compact bushy specimens, with broader leaves than usual; possibly the consequence of growing in drier ground. At first sight, I fancied that I had discovered a new species.

10. *Festuca loliacea* (*Huds.*), *pratensis* (*Huds.*), and *arundinacea* (*Schreb.*) These are all garden specimens, though the roots were originally wild. They are the two species and one variety (*loliacea*) intended under these names in the London Catalogue. I believe it would have been proper to have added also *F. elatior* (*Linn.*) to these three; and, for the present, to have placed "*arundinacea*" as a variety of *F. elatior*. By observation of the wild plants and their cultivation in the garden, I am fully persuaded of *pratensis* and *loliacea* being forms of one species: it will be seen, that the specimens of the latter show an evident state of transition from the racemed to the panicked inflorescence, and there is scarcely any other distinction between them. The large, reed-like, very harsh *arundinacea*, would seem perfectly distinct from *pratensis*, were there not the *F. elatior* to come between them. By growing it in a small flower-pot, sparingly supplied with water, I have reduced the panicle of *arundinacea* to a very dwarf condition, but the branches still spread out quite unlike those of *pratensis* after the flowering stage.

11. *Avena alpina*, (*Smith*). These also are garden specimens, although their root was brought from rocks by a waterfall above the Pass of Drumochter, in Perthshire. They seem to my eyes about the best representatives of *Smith's Avena alpina* which I have met with. On this account the root was brought home, and on this account its garden-grown flower-stems are now distributed. The plants of Yorkshire (reported as *Avena alpina*) appear rather intermediate links to connect it with *A. pratensis*; and the same also is the case with specimens of the latter, distributed by the London Society as the nearest approach (in wild specimens) to *A. alpina*; but which are labelled as "*pratensis* passing into *alpina*."

12. *Hieracium Lawsoni*, (*Smith*). Distributed to show the increased number of flowers on plants growing free from the suffocation of other species, but not in rich soil, in a garden. The wild plants have commonly from two to five flowers; the garden plants ten to fifty. Some correspondents of the 'Phytologist' have appeared to attach high importance to the number of flowers, and small differences in the form of inflorescence, among the *Hieracia*. They are, however, extremely variable in both respects. The specific name of *H. umbellatum* expresses its usual inflorescence, of some five to twenty flowers; but I have seen this converted into a panicle, with upwards of a hundred flowers, on wild specimens. *Smith's H. sabaudum* is by no means rare with only a dozen, half-a-dozen, or even fewer flowers; yet I have counted very near one thousand on the same stem, or, excluding four strong branches near the base, five hundred and ninety six. This large specimen was growing on the south-eastern slope of a railway-embankment, made from chalk and sterile sand; and in the dry summer of the present year, 1844. Its luxuriance probably arose from the humidity of the preceding summer of 1843, favouring the production of a crown of many leaves, and the free space for its roots, in the railway mound but sparsely clothed with vegetation.

13. *Veronica officinalis*, (*Linn.*) Few specimens in which the young capsules are scarcely emarginate, and in so far approach to the character of *V. hirsuta* (*Hopk.*), while the leaves remain clearly those of *V. officinalis*. I have, however, seen much better examples, where the advanced capsule of *V. hirsuta* was produced on luxuriant plants of *V. officinalis*.

14. *Veronica humifusa*, (*Dicks.*) Garden specimens approximating to *V. serpyllifolia*. In the wild state, *V. humifusa* has usually a simple, or little-branched, stem, of two or three inches in length. A plant of it brought from the Highlands in 1841, grew vigorously in the two next years, but produced no flowers. In 1844, a portion of the original plant covered a space of ground five or six feet in circumference, and was so much branched as to produce hundreds of flowering racemes: it died during the long drought of that autumn.

HEWETT C. WATSON.

Thames Ditton, December 26, 1844.

Note on Coleochæte scutata. By JOHN RALFS, Esq., A.L.S.

AMONGST the numerous additions lately made to our microscopic Algæ, there is no one more deserving of notice than the *Coleochæte scutata*, *Breb.* This minute parasite appears like a mere speck upon the leaves of aquatic plants. It was first discovered by my friend, Mr. Sidebotham, in a pond near Manchester; and has since been gathered near Aberdeen, by Dr. Dickie, and in Sussex, by Mr. Jenner, on the decaying leaves of grasses. It is also not uncommon near Penzance, but is here always found on the under surface of the leaves of *Potamogeton natans*. This plant is probably common, but overlooked from its minuteness.

Coleochæte seems to approximate very closely to the *Phylactidium* of Kützing, of which genus a species has been lately detected in Ireland by Dr. Allman. In both genera the frond is circular, and composed of series of cells radiating from a centre. If these genera are not identical, the only distinction between them depends upon the fact that *Coleochæte* in an advanced state has processes from the dorsum of the joints, each of which is terminated by a long bristle.

JOHN RALFS.

Penzance, December 26, 1844.

Notes on the species of Œnanthe. By J. S. MILL, Esq.

THE readers of 'The Phytologist,' and all botanists, are much indebted to Mr. H. C. Watson for his careful, and I believe accurate investigation, in the January number, of the three species of *Œnanthe*, hitherto confounded under the names of *peucedanifolia* and *pimpinelloides* (Phytol. ii. 11). I have long been convinced that there was some unknown quantity to be determined among the English species of this very interesting genus, which has until lately received very little critical investigation in this country. It is not generally known that one of these three species grows abundantly in so familiar and much frequented a locality as Battersea fields. I have observed it there for more than twenty years past, in a small patch of grass land, which is passed through in crossing the fields diagonally from Nine Elms, at an acute angle with the direction of the river. *Valeriana dioica* and *Polygonum Bistorta* grow copiously near the spot. I have never yet been able to procure the fruit, as the grass is always cut before the plant is out of flower. But the leaves, the tubers, and the

bractæ, agree in their characters with Mr. Watson's *CE. Smithii*, and quite differ from those of *CE. Lachenalii*. The same plant, or one apparently the same, has been seen by me many years ago, as well as lately, in meadows adjoining the river Wey, near Weybridge. Neither of these stations appears to be known to Mr. Watson; to whom I can also contribute an authentic station for his *CE. pimpinelloides*, viz: a maritime bog at the little village of Bishopstone, near Seaford, in Sussex, where I gathered unquestionable specimens in July, 1827.

While I am on the subject of this genus, I should be glad if any of your correspondents could inform me whether they have ever found the *CE. crocata* with the yellow acrid juice, which until lately has been attributed to it by all botanists. I have examined numberless living specimens of the plant in Surrey, and other counties around London, for the express purpose, and have never, in any one single instance, discovered the smallest vestige of such a juice. The assertion is a curious example of the servile manner in which even scientific observers copy each other's statements, without verifying them.

J. S. MILL.

Kensington, January, 1845.

Observations on and Description of Calamintha sylvatica, a new British Plant. By W. A. BROMFIELD, M.D., F.L.S.

By this name I have judged it expedient, for reasons I shall presently give, to designate the species lately detected by me in the Isle of Wight, and published in the 'Phytologist' for November, 1843, (Phytol. 768). To that notice I wish to add a few remarks, and correct an error or two which occur, or have rather been left standing, in the printed account. When that account was first sent to this journal, I conceived our new plant to be the *Calamintha grandiflora* of Mœnch (*Melissa grandiflora*, Linn.), but soon discovering my mistake, inserted it subsequently as the *C. officinalis*, in all probability, of the continental botanists, amongst some of whom it certainly passes current under that name; though not with all, as we shall see hereafter. But in the foot-note (Id. 769), this my original mistake remains uncorrected, and I am there made to call *that* *Calamintha grandiflora*, which, in the body of the communication, is styled *C. officinalis*. Moreover, the last seven lines of the same page should have been erased, as they relate to *C. grandiflora*, and do not apply to our *C. sylvatica*, which is a plant of the plains or of moderate elevations in

several parts of France and Germany, whereas *C. grandiflora*, as there stated, is a decidedly mountain species, differing considerably from the other in specific characters.

In my memoir just referred to, I have laid down the characters of *C. sylvatica* as distinguishing it from our more common British species, *C. officinalis* and *C. Nepeta*, and which characters I now repeat, as some of your readers may not possess the first volume of the 'Phytologist.' Those of *C. officinalis* are likewise added, for the sake of comparison.

Calamintha sylvatica. Root rather slender, much branched and fibrous, sending out one or more underground runners or stolons. Stem taller than in the next, erect or ascending, lax and slender, with few, long, distant, mostly simple and nearly erect branches. Leaves large, 2—3 inches long, dull green but not hoary, truly ovate, acute and sharply serrated, slightly attenuated at base, a few of the lowermost bluntish, with distant shallow serratures: when rubbed, the leaves emit a strong and pure odour of peppermint. Cymes (verticillasters) many-flowered, the lower ones on very long peduncles, which are mostly curved upwards. Calyx coloured (purplish), the upper teeth erect or recurved, and rather longer and more slender than in *C. officinalis*. Corolla large, nearly an inch long, pale lilac or peach-blossom, variously spotted on the lip and throat with white and crimson, its lower lip in three rounded shallow segments, of which the middle one is scarcely larger than the two lateral, and so broad as partly to cover the latter or be covered by them, concealing the sinus that separates the three divisions, which thus appear united, as they do in the wild basil (*Clinopodium vulgare*, *Linn.*). Nuts as in the following, but rather larger.

Calamintha officinalis. Root stout, woody, branched and fibrous, but without runners. Stems erect or ascending, much branched and bushy, the branches patent or spreading, usually simple. Leaves small, an inch long at most, of a greyish or hoary green, and with a bitterish aromatic odour, but not that of peppermint, and far less agreeable than in the last; ovato-deltoid or somewhat rhomboidal, occasionally nearly orbicular, broader than long, at least all the lower and larger, which approach somewhat in shape to the leaves of the Lombardy poplar; rounded or subtruncate and entire at the base, beyond that distantly and shallowly crenate-serrate, often so faintly as to appear as if quite entire throughout; more or less evidently point-

ed, but without the least tapering or acumination; at other times rounded at the apex or obtuse. Cymes many-flowered, the lower on much shorter stalks than in the other. Calyx similar, but scarcely coloured, the upper teeth simply porrected or ascending, not, as in the last, at all recurved, or even upright. Corolla scarcely half the size of the other's, and paler, with a few spots or blotches of dark red on the lower lip, the segments of which are very unequal and distinct, the middle one greatly exceeding the two lateral in length, cordate and subemarginate, its apical lobes, from their projecting so far beyond the lateral segments, not overlapped by or overlapping these last, nor concealing the deep cleft between them. Nuts minute, pale brown, roundish ovoid, thickly dotted with depressed points.

I have only to add, that our new plant is, as it were, a transition species between *C. officinalis* and *C. Clinopodium* (*Clinopodium vulgare*, *Linn.*), uniting the lax cymose inflorescence of the former with the general habit and structure of corolla of the latter. The root, also, is like that of the last, slender and creeping, not as in *C. officinalis*, stout and simply branched, or without runners, a most valuable distinction, first pointed out by my friend Dr. T. B. Salter, of this town. In the large, truly ovate and acutely serrated leaves, great size of the blossoms, which appear to have a similarly constructed corolla, and in the grateful, purely peppermint odour of the herbage, our Isle of Wight plant makes an approach to *C. grandiflora*, for which, as I have before said, it was at first mistaken by myself. That species is, however, truly distinct in its more coarsely and deeply serrated leaves, very few-flowered verticillasters, still larger blossoms, and notably by the very much larger, most conspicuous calyx.

The specimen of *Melissa Calamintha* in the Linnæan herbarium, which I have consulted expressly to determine, if possible, the synonyms of our British species, seems rather to be a fragment of *M. Nepeta*, differing from another indubitable specimen of the latter, and equally authenticated by Linnæus himself, chiefly in the relative length of the common flower-stalks; almost the only character given by Linnæus in the original edition of the '*Species Plantarum*,' for distinguishing the two: thus clearly showing an imperfect acquaintance with the living plants, neither of which is an inhabitant of Sweden.*

* I confess myself to have always entertained considerable doubts of the specific difference of *C. officinalis* and *C. Nepeta*, from inability to find any good permanent characters, beyond a certain difference in size and habit between them; an opinion in which I am supported by more than one of our leading botanists.

From the foregoing statement it is evident that by his *Melissa Calamintha* Linnæus intended either the plant so understood by us in England, or the other of our two commoner British species, *M. Nepeta* (the *Thymus Calamintha* and *T. Nepeta* of Smith); we think the former, from the circumstances just detailed. Be that as it may, the Isle of Wight plant is assuredly neither the one nor the other, and therefore *cannot be* the *Melissa Calamintha* of Linnæus, or be justly designated by any of its supposed synonymes. If our two old Calamints are kept distinct, the greater one may, without much risk of creating a misnomer, be considered as the *Melissa Calamintha* of Linnæus; if, on the contrary, experience should demonstrate both to be but one species, that name may still be preserved to each variety, or be merged in that of the lesser, or *M. Nepeta*.

I have ascertained most satisfactorily, from descriptions, plates and specimens, that our island plant is the *Melissa Calamintha* of Benthams,* Reichenbach, Hoppe, and other distinguished botanists, and not less convincingly that the genuine Linnæan species of that name is by others as well known and recognised abroad as it universally has been in this country, though the nomenclature and synonymes of all the three are often strangely confused and misunderstood, for want of clear specific characters to each. Now it being manifestly inadmissible for two species to retain the same name, I have ventured to bestow a new appellation on the subject of these remarks, and have accordingly called it *sylvatica*, from its place of growth, so different from the open sunny situations which the other British species affect, but in which this languishes. So much, indeed, does our plant love shelter, that its beauty is best displayed by growing it in pots, and keeping it in the greenhouse, where it will amply repay the trouble of the cultivator, in the long raceme-like aggregate of cymose clusters, with their large unilateral blossoms of a delicate rose-colour, elegantly spotted, and of transparent brilliancy. It is easily propagated by cuttings, which strike readily.

WM. ARNOLD BROMFIELD.

Ryde, Isle of Wight, Jan. 15, 1845.

* As I learn from the talented author of the *Monographia Labiatarum* himself.

Cnicus oleraceus a British Species. By W. A. BROMFIELD, M.D.

A SPECIMEN of this plant is in the herbarium of Mrs. M. Stovin, of Ashgate, near Chesterfield, gathered by herself in 1816, from a root found by Mr. Oldham, nurseryman, at Sheffield, apparently wild, in Lincolnshire, and by him transferred from its native locality to his garden in Yorkshire. The specimen I saw when on a visit to that lady in November last, and from her received the above particulars. As this species is very widely distributed over the continent of Europe, it may be reasonably expected to occur in our own country, and the above notice will, we hope, serve as an encouragement to look out for it in that part of England. We are not aware that *Cnicus oleraceus* is ever cultivated, either for use or ornament, so that it may fairly be presumed to have been wild in the place where it was discovered.

WM. ARNOLD BROMFIELD.

Ryde, January 15, 1845.

Discovery of Bryum roseum in fruit, at Lydford, Devon.

By the Rev. W. S. HORE, M.A., F.L.S.

THE Rev. C. A. Johns and myself were fortunate enough to find this beautiful species of *Bryum* in fructification about six years since, in the woods surrounding the waterfall at Lydford. At that time we were accompanied by some friends, who were not botanists, which prevented us from making so thorough a search as we could have wished, and were therefore reluctantly compelled to quit the romantic valley of the Lyd with only six specimens bearing capsules. As the moss itself, in a barren state, was abundant, we determined on renewing our search at some future opportunity, in hopes of being enabled to enrich the herbaria of our muscological correspondents with specimens of the plant. This opportunity, however, did not present itself till the present month, when a visit to Plymouth by Mr. Johns enabled us to carry our good intentions into effect. The long drought of the past summer held out hopes that we should be successful, as, from the want of moisture, we anticipated that this moss, like other plants having a tendency to increase by their roots in wet seasons, would be thrown into a capsuliferous state. Whether we judged correctly or not, I will not say, but we managed, after a close search of between three and four hours, to collect about eighty specimens. Of these, one was provided with four setæ; two with three; one with three, two of which were united till within three lines of the summit,

and presented the appearance of a single seta up to the point of separation, furnished with two capsules; about twenty with two setæ, and the remainder with one only. The moss in a barren state appeared to be more abundant than when we first met with it; but this may perhaps have arisen from the more minute search which we made. It extended far up into the steep woods, flourishing in the greatest luxuriance where the ground was kept in a constant state of moisture by springs or small streams of water from the higher parts. In these places, however, we did not discover any plants in fruit, although we carefully examined them. Our harvest was gathered on, comparatively speaking, dry ground,—on the land near the river, or, I should rather say, mountain torrent. Here the bright red colour of the setæ enabled us to detect the object of our search, growing in the midst of tufts of *Hypna* and other mosses, chiefly around the roots of trees. Few solitary plants in the desired state were met with; where we discovered one, we always calculated on finding some half dozen within a distance of one or two feet: in one instance we collected upwards of twenty in a spot of the above limited size.

Any muscologist visiting this part of Devonshire in December, would be amply rewarded by a day's stroll in Lydford woods, which are as beautiful as any in the county. He would derive gratification not only from a vasculum well filled with mosses (*Bryum roseum*, to wit), but from the wild scenery surrounding the rapid Lyd in its course to the Tamar.

Either the Rev. C. A. Johns, Grammar School, Helston, or myself, will be happy to supply any muscologist, to whom this moss in fruit may be a desideratum, with a specimen, as long as our stock of duplicates enables us to do so.

W. S. HORE.

Trafalgar Place, Stoke Devonport,
January 15, 1845.

Wistman's Wood and Anomodon curtispiculum.

By the Rev. C. A. JOHNS, M.A., F.L.S., &c.

WISTMAN'S WOOD is situated on Dartmoor, about a mile above Two Bridges, on the left bank of the river. Imagine a mountain stream, creeping slowly among blocks of moss-stained granite; on either side extends a piece of flat boggy ground, to an inconsiderable instance; and at the extremity of these the hills rise to the height of

two or three hundred feet, capped here and there in the distance with *tors*, or rugged summits of granite. The hill-side is confusedly heap-
ed with blocks of the same stone; and it is in the interstices between
these, that the trees composing Wistman's Wood have chosen to fix
their habitations—a colony of patriarchs in a wilderness. The wood
itself forms a ragged and interrupted belt, of about half a mile in
length, including some straggling trees, separated at long intervals.
The best way of approaching it is from above, for by so doing one
may, without difficulty, obtain a pretty good view of nearly the whole
at once, and plunge in among the trees at pleasure. The trees are all
oaks (*Quercus pedunculata*), from ten to fourteen feet high, gnarled,
knotted and twisted even beyond the usual characteristic of that tree.
The trunks vary from two to five feet in circumference. One which
was measured consisted of three trunks, branched just above the base,
each bole being about three feet in circumference. But by far the
strangest peculiarity is, that all the branches, with the exception (and
this not always) of the extreme spires, are matted with deep beds of
moss, principally *Anomodon curtipendulum* in fine fructification.
Some idea of the denseness of this extraordinary integument may be
formed from the fact, that the moss is, in most cases, from ten to
twelve inches in thickness, when the diameter of the branch does not
exceed an inch and a half. It seems very probable that the superin-
cumbent weight may operate in producing the depressed character of
growth: certain it is that a single holly-tree, near the centre of the
wood, which is free from parasites, has attained the height of twenty
feet, and towers above his pigmy companions, like some tall pine in a
wood of ordinary growth. When first we saw this tree, indeed, hav-
ing nothing to compare it with of definite size and shape, but the sur-
rounding oaks, we fancied that it was a fir-tree, and the oaks borrow-
ed from it, by comparison, a dignity not their own. On a rough
guess there are from 300 to 500 veteran trees in the wood, and as we
were very glad to find, a great number of saplings.

C. A. JOHNS.

Helston, January 11, 1845.

Notice of 'The Annals and Magazine of Natural History,'

No. 94 and 95. January, 1845.

No. 94 contains a continuation of Mr. Ralfs' paper on the British
Desmidiæ, describing the genera *Xanthidium* and *Pediastrum*, toge-

ther with three species of the former and four of the latter. These minute beings are found in bogs and boggy pools. Almost contemporaneous with Mr. Ralfs' observations are those of Mr. White, who, in the 'Transactions of the Microscopical Society,' has described and figured as *animals*, certain fossilized spores of these obscure plants.

On *Helianthemum guttatum*, noticed in our last number, the editor gives the following note. "I possess a specimen of the true *H. guttatum*, gathered by Miss H. Townsend, at Three-castle Head, near Crookhaven, in the county of Cork, one of the extreme south-western points of Ireland, and thus restore it to its place in the British Flora, of which it has only just been deprived. The Anglesea plant called *H. Breweri* by Dr. Planchon, has bracteated pedicels and obovate lower leaves, but *H. guttatum* has no bracts and oblong lanceolate leaves. It is singular that all our botanists should have overlooked these very obvious distinctions, but probably the extreme rarity of the plants, and the small and usually imperfect state of the specimens from Anglesea, may somewhat account for it.—C. C. B."

Elatine hexandra and *hydropiper*. "I find that I have fallen into a mistake concerning the discovery of these plants in Surrey. Mr. Newnham does not claim their discovery, which I am informed is due to Mr. Walter Reeves.—C. C. B."

No. 95. contains 'Memoirs on Geographic Botany. By Richard Brinsley Hinds, Surgeon R.N., F.R.C.S.' and 'Description of a New Species of *Melanogaster*. By C. E. Broome, Esq.' This is thus characterized :—

"*Melanogaster Berkeleianus*, n. s. Parvus, globosus, longe radicans; peridio sericeo albo; tactu gilvo fusco, intus pallide flavo; sporis minutis oblongo-ellipticis hyalinis albis, binucleatis." It grew "in a loose soil, in a wood composed of hazel, beech, and firs, in October last," but the author does not mention where.

Besides these articles there is a short extract from the *Comptes Rendus*, but both numbers are particularly barren of matter connected with British Botany.

Proceedings of Societies.

BOTANICAL SOCIETY OF EDINBURGH.

December 12, 1844. — The Society this day held its first meeting for the session; Dr. Seller in the chair.

Numerous donations to the library and museum were announced, particularly from Dr. Fraser, Alcoa Bay, eleven volumes of botanical

works, and specimens of Cape woods and plants. From the Rev. J. E. Leefe, the second fasciculus of his '*Salictum Britannicum Exsiccatum*.' From Dr. Dewar, Dunfermline, plants from the river Congo, &c. From Mr. Charles Lawson, jun., plants from the Rocky Mountains, &c.

The following communications were read : —

1. Notice of the discovery of *Alsine stricta*, in Teesdale, by Messrs. G. S. Gibson, and J. Tatham, jun. Specimens of this interesting addition to the Flora of Great Britain, kindly communicated by the above named gentlemen, were exhibited.

2. On the genus *Spirulina*, by Mr. Ralfs, Penzance. One species only, the *S. tenuissima* of Kutzing, was described.

3. Notice of the discovery of *Cirsium setosum*, *Bieb.*, near Culross, by Dr. Dewar. This plant, which is also new to Britain, was discovered in July last, by Dr. Dewar, Dunfermline, growing on the coast of the Frith of Forth, near Culross; and through the kindness of that gentleman, numerous specimens were supplied to the Society. It is a native of Odessa, and has probably been introduced from thence among agricultural seeds or ballast.

4. Journal of a Tour through part of the United States and the Canadas (continued), by Mr. James M'Nab.

In the last part of this paper read before the Society, Mr. M'Nab gave an account of the botanical features of the country in the neighbourhood of Stillwater, and concluded with an examination of the woodland grounds in the vicinity of Whitehall; the present portion embraces the journey from the latter place to Montreal.

"Entering another steam-boat at the southern extremity of Lake Champlain, the course is winding and narrow, having considerable tracts of level ground extended on each side. The woods for the first sixteen miles are very various, the principal trees being the wild cherry (*Prunus Virginiana*), elms, walnuts, sugar-maple, with the aspen poplar (*Populus tremuloides*). The rocky grounds overhanging the lake were densely clothed with the *Arbor-vitæ*. After having fairly entered upon the expanse of the lake, the appearance of the lofty white or Weymouth pines (*Pinus strobus*), towering above the deciduous trees, along the rising grounds at the base of the hills, was remarkable; most of them being destitute of branches, which gave them more the appearance of palms than pines. About Essex, half way along, the lake widens, and all at once the wooded rocky land by the water's edge is changed for a rich champaign. The fields of the dif-

ferent farms being laid off in squares, and each farmstead having a large orchard attached to it, render this tract with its natural beauties very interesting. The soil seemed a light-coloured clay, and the wood on the lower grounds was not very plentiful; but the rising grounds behind were closely studded with scraggy pines.

"Approaching the northern extremity, the lake begins to contract; by this time we had entered upon the lower Canadian territories. The country here presented a totally different appearance, owing to the dense dark masses of pines, elms and spruces, which covered a vast extent of the country, and having every here and there along the edge of the lake, rustic but picturesque log houses, inhabited by French Canadians, employed in felling the timber, dressing and carrying it to the lake, for the purpose of being floated down to the harbour at Lapraire, on the St. Lawrence river, for exportation. On reaching St. John's, the northern extremity of Lake Champlain, the forests presented the same appearance as they did when we first entered upon the lake, with the addition of the balm of Gilead fir (*Abies balsamifera*); numbers of this tree were seen covering the drier grounds, the largest observed did not exceed thirty feet in height and four feet in circumference. On the dry surface of these woods, the spice-root (*Dalibarda repens*) formed exceedingly beautiful tufts, resembling, in its ground-clothing propensity, the *Epigæa repens*, as seen in the New Jersey forests. The sugar-maple (*Acer saccharinum*) is here in greater quantities, and attains a larger size, than hitherto noticed; and notwithstanding the great mutilation to which it is yearly subjected, in spring, for the sap, which is here extensively used in the manufacture of sugar, it appears in the most perfect state of health.

"At St. John's, in the swampy grounds and in the shallow water by the edge of the lake, we picked luxuriant flowering specimens of the sweet flag (*Acorus Calamus*), *Iris versicolor* and *Utricularia vulgaris*. On the drier grounds, *Eupatorium verticillatum* was the chief plant in flower, and covered a great extent.

"Passing onwards to Lapraire, the only tree observed of any interest and deserving of notice, was the canoe-birch (*Betula papyracea*). Several compact masses of these trees, evidently of second growth, occupied the lower grounds; but from their closeness none had attained a great size. Large trees, however, must exist in the neighbourhood, though we did not fall in with them, as many of the canoes in this district were made from the bark of this tree. The greater number, however, were scooped out of the trunks of the fir-tribe.

"On crossing the St. Lawrence to Montreal, we were much surprised to see the great difference which the Canadian winter produces upon the species of ornamental trees which grace the lawns and cities of the United States. As examples may be mentioned the *Ailantus glandulosa*, the trees here being quite small and stunted; the Osage orange (*Maclura aurantiaca*) seemed barely alive; mulberries were small and unhealthy; weeping willows were almost always killed in winter, although in the neighbourhood of New York the stem of this tree is seen averaging from eight to fifteen, and sometimes twenty feet in circumference. None of the *Catalpa* trees and *Magnolias*, which prove so ornamental in the pleasure-grounds both of New York and Philadelphia, can be made to thrive, with the exception of *Magnolia glauca*; and they are in a very unhealthy condition. The deciduous cypress (*Cupressus disticha*) is also much dwarfed. Evergreens, with the exception of the fir tribe, were rarely to be seen, unless protected by glass. On visiting the gardens and nurseries in the neighbourhood, we were much gratified at finding them so well managed, and chiefly under the superintendence of Scotch gardeners. On the garden walls we observed healthy trees of peaches, apricots and nectarines, having well ripened wood, and every appearance of affording plentiful crops. Gooseberries and currants were in great abundance, with high-flavoured fruit, which is seldom to be met with in the gardens of the United States; apples were plentiful, but pears rather scarce. Vines trained on espaliers had a promising appearance.

"In the nursery grounds the fruit and flower departments seem to receive the most attention. Few, however, of the indigenous plants are cultivated, although considerable quantities of the genera *Cypripedium*, *Trillium*, *Orchis*, *Habenaria*, *Goodyera*, *Calypso*, *Pagonia* and *Sarracenia*, procured from their native habitats when in flower, lay stored in boxes for sale and barter with the British merchants.

"We next proceeded to the Montreal mountain, situated to the north-west of the town. A number of fine specimens of the sugar-maple were seen, with a great mixture of other shrubby plants. The lime-trees (*Tilia Americana*), had a singular and beautiful effect, from the large size of their foliage — some of the leaves measured thirteen inches long and eleven broad.* Very few herbaceous plants were got in a fresh state, owing to the penetrating rays of the sun having scorched everything. In very shady places, chiefly on the north and east side of the mountain, we procured a few good specimens in flower

* A specimen of a leaf of the size here described was exhibited to the meeting.

of *Orchis macrophylla*, *Corallorhiza multiflora*, *Aralia hispida* and *ramosa*, *Aster acuminata*, and *Aspidium bulbiferum*, which, with the *Cyperus retrofractus* from the most exposed places, formed the most interesting part of our collections this day. After some difficulty we reached the summit, and the view as seen around was truly grand. Here we beheld the St. Lawrence winding its way through a vast extent of level country, while in various parts extensive wooded islands were seen obstructing its course. On descending the south side of the mountain, which is closely wooded, the thermometer indicated 80° of Fahrenheit. The exertion caused by ascending and descending was overpowering; and owing to the parched state of the ground, and the flaccid vegetables with which it was covered, walking was rendered nearly as difficult as over sea-weeds on a rocky shore."

At this meeting the election of office-bearers for the ensuing year took place; when Dr. Douglas MacLagan was chosen President, and Professor Graham, Drs. Lowe, Greville and Seller, Vice-presidents.—*Edinburgh Evening Post and Scottish Record.*

Thursday, January 9, 1845. Dr. Douglas MacLagan, President, in the chair. The following communications were read:—

1. Notice regarding a plant from Ichaboe, supposed to yield African Olibanum, by Dr. D. MacLagan.

The plant in question had been picked on the coast of Africa, close to the Island of Ichaboe. Nothing was known regarding its botanical characters, as it was destitute both of foliage and inflorescence: its habit, however, was very peculiar. A short stem, about four inches long and two thick, terminated above in a round knob, from which the principal branches arose, and each of these was ended by a similar knob, from which the short, thick, and abrupt branches sprang in an irregularly trichotomous manner. Microscopic examination of the wood did not elucidate its history. On making a section of a branch, a soft resinous matter exuded, which by exposure dried up and became brittle. Dr. M. had succeeded in collecting some of this, and found, that like African Olibanum, it consisted of resin, volatile oil, and a peculiar matter analogous to, but not identical with, gum; and it was quite possible that this might be the plant yielding the African Olibanum, which drug had never yet been traced authentically to its source. Dr. MacLagan was confirmed in this belief, by finding on a specimen of African Olibanum in his museum, pieces of the bark of a tree, exactly agreeing in physical characters with the bark of the plant now before the Society. Dr. MacLagan's object in making this communication, was to direct attention to the subject, in

the hope that some of the many persons now visiting Ichaboe, would bring home specimens of the plant, and of the resinous matter, in order that this question might be properly investigated.

2. On the genus *Coleochaete*, by Mr. John Ralfs, Penzance.

3. Journal of a Tour through part of the United States and the Canadas (continued), by Mr. James M'Nab.

"The extract read before the Botanical Society on the 7th of December last, from my American notes, chiefly related to the botanical aspect of the country observed from Whitehall, through Lake Champlain to Montreal; the present portion embraces the journey from Montreal to Kingston.

"Leaving Montreal for the upper province, the traveller experiences very great delight from the interesting chain of conveyance caused by the various rapids and cascades which every here and there prevent the possibility of a continuous steam-boat communication. The first nine miles to La Chine was by coach, the road running close by the bank of the St. Lawrence; along this district farming appeared to be carried on with much spirit, women as well as men being employed in the fields. In many localities we observed extensive and productive apple-orchards, chiefly of the rennet description. Several varieties of ornamental trees were seen gracing the neighbourhood of dwellings; of these the Lombardy poplar and golden willow formed the chief exotics. The most abundant weeds seen in flower along this line of road were succory (*Cichorium Intybus*), elecampane (*Inula Helenium*), mugwort (*Artemisia vulgaris*), and the gigantic mullein (*Verbascum Thapsus*).

"From La Chine we proceeded to the town of Cascades by steam-boat. The distant lands seen on both sides of the river, appeared dark with uninterrupted pine-forests, forming a striking contrast with those lively and beautiful residences which every here and there occur by the edge of the water. The river is here somewhat extended, assuming the appearance of a lake, and is much intersected with islands of various dimensions, also dark with coniferous vegetation.

"At Cascades, coaches were in readiness to convey the passengers to Coteau de Lac. This is a very interesting part of the country; the varied and picturesque scenery afforded by the river, which every now and then met our view, when launching from the various thickets through which our course lay. During the latter part of this line the road and adjoining ground was chiefly of deep loose sand, entirely destitute of vegetation.

"From Coteau de Lac we visited most of the towns of interest on

the St. Lawrence; and although much gratification was experienced during its whole course, it was not till reaching Brockville that we really felt our presence in a foreign land. Here the river is extended to a lake, and much interspersed with islands; this portion has therefore been admirably designated the 'Lake of a Thousand Islands.' These islands are of sizes varying from a few yards square to many acres in extent, mostly wooded and rocky, in many cases rising from five to thirty feet above the level of the water; a few have been partially cleared and cultivated, and have neat residences upon them. During our course from Brockville to Kingston, we visited several of the uncultivated islands, and proceeded over their surface with much difficulty, owing to the numerous large trunks of trees which had been blown down at various periods. Many of these gigantic masses, composed chiefly of white pines and hemlock spruces, measured from ten to fourteen feet in circumference. Several were so completely decayed as to have their surface green with *Hypnum* moss, forming seed-beds for young trees of various descriptions. *Arbor-vitæ* were abundant on them, having their tender roots ramifying through the decayed mass. In no instance did we observe a plant of seedling pine on any of the stems of the fir tribe.

"The principal tree growing on these islands was the *Arbor-vitæ* (*Thuja occidentalis*), which generally surrounds the rocky places; then came the oaks, ashes, hickories, elms, sugar-maples, with the poplar-leaved and black birches (*Betula populifera* and *lenta*), and generally in the centre were the white pines and hemlock spruces, evidently requiring more shade and damp than the deciduous trees; being rarely seen in their natural condition wholly exposed. *Rubus spectabilis* was in beautiful flower among the rocks, also the Indian hemp (*Apocynum androsæmifolium*). On the surface of the soil under the trees we observed considerable quantities of the following herbaceous plants; viz., *Scrophularia marylandica*, *Teucrium canadense*, *Cypripedium humile*, *Fumaria glauca*, with *Lycopodium complanatum* and *dendroideum*.

"On reaching Kingston, forty-eight miles above Brockville, we remained for several days, and made excursions during our stay in various directions. The first was towards the north-east; proceeding from the town, we came upon several extensive portions of level limestone rocks, nearly destitute of surface soil; from their size and position they greatly resembled the tombstones in a burying-ground. In the crevices of these rocks many large plants of Juniper were growing; this variety differed from the British by being more glaucous in colour,

and bearing much larger fruit. On entering the woods, the trees were of various kinds and sizes; oaks varied from six to nine feet in circumference, elms from eight to ten, white pines from seven to twelve, and tapering to one hundred feet of elevation. In one spot we observed six fine specimens of the white pine, within twenty feet of each other, and each ten feet in circumference, appearing as if they had belonged to the original forest. Amongst the rich vegetable soil on the surface of the ground under the deciduous trees, we picked remarkably strong specimens of the coral-root (*Corallorhiza multiflora*), and on the dry barren soil under the pine trees, *Rudbeckia divaricata*, *Aster macrophyllus*, *Pyrola uniflora*, with *Monarda fistulosa* and *mollis*, were the chief plants in flower. A considerable extent of the rough stony ground presented at this season of the year (29th July) a singular appearance, from the quantity of golden rod (*Solidago altissima*) with which it was covered; mixed with it was the lion's foot (*Prenanthus serpentaria*); this plant is very much diffused over the country, and generally found in situations most likely to be infested with rattlesnakes, and is extensively used by the American Indians as an antidote for the bite of these venomous reptiles. On the surface of some exposed neglected lands, the button-wood (*Cephalanthus occidentalis*) formed extensive groups. *Astragalus canadensis* was also plentiful, with large and fine-flowered specimens of *Scutellaria galericulata*. On the damp places *Lobelia Kalmii* was richly clothed with its beautiful blue flowers, in company with *Campanula asarina*. In the marshes *Utricularia vulgaris*, *Ranunculus filiformis* and *Achamera rigida* were the chief plants in bloom: and here, for the first time, we observed the Tuscarora or wild rice (*Zizania aquatica*), covering a considerable portion of clear shallow water; it stood two feet above the surface, and was in full flower. From its quantity, and graceful waving in the wind, it greatly resembled a field of oats." — *Id. Jan.* 18, 1845.

BOTANICAL SOCIETY OF LONDON.

January 3, 1845. J. E. Gray, Esq., F.R.S., &c., President, in the chair. Mr. S. Gibson presented a specimen of *Scirpus acicularis* (*Linn.*), with much longer stems than ordinary. The culms formed a dense tuft, about fourteen inches high.

Mr. Fitt presented specimens of an *Ceanothe*, commonly considered *C. pimpinelloides* by the botanists of Norfolk. It is the *C. Lachenalii* (*Gmel.*) of Babington's Manual, and the species confused

with or mistaken for the true *pimpinelloides*, by most other English botanists, since the time of Hudson. Four of the specimens were selected from the Society's herbarium, as showing variations from the normal character of the root. Some of the tubers were branched; some approximated to those of Smith's "*peucedanifolia*," in being thicker and shorter than ordinary. On one specimen, the external fruits in the umbellules are very slightly contracted at their base; the ridges being confluent, and forming a ring, much like the callous base of the fruit in the true *pimpinelloides*. The specimens were located from salt ditches near Yarmouth.

The Secretary called the attention of Members to a series of specimens of *Dryas octopetala* (*Linn.*), which had been sent to the Society some years ago by Mr. Tatham, from Arncliffe Clouder, Yorkshire. The sepals or lobes of the calyx varied considerably in length and breadth; on one specimen, the length was scarcely twice the breadth, while in another, the length was four times the breadth. The convexity of the base of the calyx also varied much. He reminded the meeting that Mr. Babington had described a second species of *Dryas* (*D. depressa*, *Bab.*), found in Ireland, and distinguished from the well known *D. octopetala*, by exactly the same characters which these specimens proved to be within the range of variation of the true *D. octopetala*. He had not seen any example of the *D. depressa* described in Babington's Manual, and could not speak with certainty about its claims to be held a distinct species; but the published characters by which it was attempted to be distinguished from the better known species, were scarcely sufficient, with these examples before the Society. When a series of specimens of *D. octopetala* are examined, it will be seen that the sepals are usually broader in those which are more advanced in the fruiting stage, as compared with others just opening into flower. Of the specimens before the Society, the one having the broadest sepals was advanced in fruit. But it was proper also to observe, that on this specimen a single sepal was longer than the rest, and had apparently been white and petal-like at its extremity; it might therefore be held an aberration, rather than a healthy variation, from the normal form. — *G. E. D.*

Erratum.—Phytol. i. 1079, line 15, for "but generally [separates] first from the base, meeting" &c., read "but generally, from the base, first meeting," &c.

Notes on a Botanical Tour in Germany.

By JOSEPH WOODS, Esq., F.L.S.

(Continued from page 42).

On the 22nd July I set off in company with Mr. G. Woods, on an expedition to the Schneeberg; a mountain, I believe not quite 7,000 feet high, but which always retains a portion of snow in the upper hollows, and may be considered as the most easterly of this limestone chain of the Alps. We took the railroad to Felixdorf, where we got an Einspanner to Gutenstein, at the edge of the mountain district. Three or four rocky romantic valleys here unite, and a beautiful little park, with very pleasant and easy walks, give us a great variety of charming scenery. The botany is as good as the scenery, and a very short walk produced *Silene saxifraga*, *Arenaria grandiflora*, *Galium aristatum*, and *Moehringia muscosa*.

Euphorbia saxatilis, *Potentilla caulescens* and *Seseli glaucum* also grow on the rocks about. It is a point where a large portion of the plants of the limestone hills already enumerated meet with those which descend from the mountains. The Schneeberg is divided into two great parts, the Kuh Schneeberg, which does not rise above the region of the spruce fir, and the Great Schneeberg, which is, perhaps, nearly 2,000 feet higher. We directed our course through the woods to the hollow between the two, and then keeping to the right, made our way to a sort of inn which has lately been erected on the Kuh Schneeberg. The external circuit of this mountain seems to be everywhere steep and rocky. The summit is far from flat, but rises into knolls, two or three hundred feet high, with but little of exposed rock. The fir-trees, as they fall, are mostly left to rot upon the ground, as not worth the labour of carrying them down, and consequently the soil is everywhere composed of decaying wood, while the trunks and branches, which still retain some solidity, make rambling about a work of difficulty. On the ascent, we observed the leaves of *Helleborus niger* in great abundance; *Pyrola secunda*, *P. rotundifolia*, and *P. uniflora* were also plentiful, but except a stray specimen or two, out of flower. *Veratrum album* is common among all the lower hills. *Senecio subalpinus* of Koch grows in the woods. *Rumex alpinus* is in enormous abundance about the cattle-establishments on the top, and with it grows *Cineraria crispa*.

Aspidium montanum occurs on the ascent; and on the rocky crest of the mountain, *Veronica saxatilis*.

We slept in the Kuh Schneeberg. The night cold and windy;

the morning cloudy; the clouds hanging on the higher summits. Our guide wanted to persuade us, that any further ascent was impracticable, and that we had better descend at once to another house of entertainment, called the Höchbauer, belonging to the same man, at the foot of the mountain. We ascended one of the knolls over the fallen trees and rotten stumps, in order to obtain a better view. The mist had disappeared from many of the surrounding summits, and even from some which still retained a portion of snow, and though still heavy on the great Schneeberg, it was evidently rising. We therefore determined to pursue our scheme, seeing we had always the power of returning, should the fog increase. Our guide was excessively out of humour at this determination. He had been flattering himself that he should get the reward for his services without incurring the labour, and moreover, it appeared afterwards that he was entirely ignorant of the country between the Schneeberg and Reichenau, although he had promised to guide us to the latter place. I added *Tozzia alpina* and *Potentilla aurea* to the plants I had gathered on the Kuhschneeberg, and the ascent of the great one was rewarded by *Rhododendron hirsutum*, *Campanula alpina*, *Hedysarum obscurum*, *Oxytropis montana*, *Viola alpina*, *Soldanella pusilla*, *Androsace Chamæjasme* and *A. lactea*, *Pinus Pumilio*, *Primula spectabilis* and *P. minima*.

The weather cleared as we advanced, and we had an extensive view of rugged and broken mountains; not, according to Gilpin's distinction, a mountain view. We stopped at the Baumgarten, where there is another public house, and where we had had some thoughts of staying the night, but the Botany did not appear to be interesting, and to feel that I had been hurried away from the rich harvest of the Great Schneeberg to waste four or five hours in a poor little inn, which had no advantage of situation to recommend it, was too provoking; we therefore continued our walk over another and lower division of the mountain to Reichenau. Most of the latter part of the walk is on a Riesen, or Giant, the name here given to the slides down the mountain, which are made for the timber. The descent of the wild magnificent rocky ravine is, however, more rapid than that of the Giant, which is interrupted two or three times, and the logs of timber are precipitated on banks of loose earth and stones, whence they have again to be collected, and placed on the next division of the Giant. These slides are only used in the winter, and are watered before being used, if Nature have not already furnished them with an icy coat.

The day after our descent from the mountain we made an excursion up the Höllen Thal, the most magnificent mountain pass I ever saw. Towering precipices of limestone rock rise at various heights on both sides, from among the sloping woods, with hardly room for the road, and the bright rushing stream between them. The rocks themselves are adorned with wood, where earth enough can collect to afford a little nourishment to the roots. *Lycopodium helveticum* was growing on the banks of the river, and *Peucedanum verticillare* in similar situations, but not yet in flower. We left the principal valley to visit a hollow called the great Höllen Thal, where some banks of shiver afforded us *Arabis vochinensis*, *Linaria alpina*, *Lunaria rediviva*, *Androsace lactea*, *Silene alpestris*, and several other mountain plants; and at the Kaiser brunnen we got *Betonica alopecurus*, a plant which was abundant enough on our next day's walk. These banks of shiver are often very useful to the botanist, bringing down with them many of the plants of the mountain tops, which he thus obtains without the labour of climbing to them, and they here mostly come into flower earlier than in their original position.

We engaged a carriage to Prein on the next day. The lower part of the hill is slaty, but it afforded us, I think, nothing new, but *Galium rotundifolium*. On the pastures above, and among the bushes of *Pinus Pumilio*, we gathered *Achillea Clavennæ*, and *A. Clusiana*, *Potentilla Clusiana*, *Gentiana acaulis* and *G. æstivalis*, which is probably a var. of *G. verna*, *Arenaria austriaca*, *Primula spectabilis* and *Homogyne discolor*.

On the 29th I walked to the Türken Schänze; I have already given the botanical result. Most of the plants which grow there are early, and I should have done better to have made it one of my first walks about Vienna. On the 30th I walked to the Marxer Linien, which is said to be the station of some rare plants, but I did not find even a locality which I could suppose to be productive. The hackney coaches at Vienna have no fixed prices, and the knowing how to bargain with them is a science of itself, in which the people of Vienna are said to be very expert: I have offered two zwanzigers (one shilling and four pence) for a distance less than a mile, and it has been refused. They are generally unwilling to take short fares.

On the 31st July I left Vienna as I came to it, in the rain, but it afterwards cleared, and we had a pleasant voyage, and the night so warm, that many of the passengers passed it on the deck. Had it been otherwise, I do not know how we should have managed, as the sleeping accommodations are very imperfect, and we were over full. At

about two the next day we arrived at Lintz, but it set in wet again in the evening, and continued so all the next day. On the third I was called at ten minutes past four, in order to start by the railroad at six. The day was beautiful, and a magnificent view of distant mountains relieved the monotony of the plain over which our route lay. I was at a loss to account for the quantity of snow on these mountains, of which the highest does not exceed 10,000 feet, till I learned at Ischl that, even there, what was rain at Lintz, had been partly snow. I left the carriage, to walk to the falls of the Trann, a wild scene of roaring waters, but not of any great elevation. I attempted to follow the stream, but the late rains had swelled the waters, and I found it impracticable. *Potentilla caulescens* is plentiful by the river side, and I gathered one plant of *Allium fallax* in the woods above. The carriages on this railroad are propelled by horses, and not by steam; and the great object is the conveyance of salt from the Salzburg district, of which the company has the exclusive privilege. At Lambach a considerable number of our passengers left the train to get into diligences, which were waiting to convey them to Salzburg.

Gmunden is beautifully situated at the foot of its charming lake. In the immediate neighbourhood are meadows, and cultivated ground; a little further on the left, the rugged Traunsteen rises almost perpendicularly from the water, and still farther, to the right of the lake, stretches the wild ridge of the Höllengebirge, spotted with snow. A steam-vessel took me in the morning to Ebensee, at the opposite end of the lake, and a "Stell wagen," a sort of diligence, through a magnificent mountain pass, to Ischl. Here I dined, and then proceeded to Hallstadt, but the rain came on long before I got there.

The lake of Hallstadt is wilder and more magnificent than that of Ginunden (the Traunsee), the mountains descending all round, almost perpendicularly, into the water. The little town itself stands partly on the flights of steps on the mountain side, and partly in the water. The next morning the scud was floating on the mountain sides, and clouds covered the tops and the sky, so I thought it would hardly do for a long mountain walk, but determined to look about me a little, and see what sort of a place I had got into. A flight of steps, leading in a zigzag line through the woods, seemed to give me an opportunity of ascertaining what these hanging woods would produce, and tempted me on to some high meadows. At the top of these was a sort of village, with saw-mills, and marble-quarries; above these again, woods; and still higher, broken ground, and a slope of fragments.

The change continually urged me forward, till I found myself among patches of snow. There *Dentaria enneaphylla*, *Aposeris foetida*, and *Clematis alpina*, totally out of flower in the lower woods, still displayed their blossoms. I also got *Rhododendron Chamæcistus*, *Pyrus Chamæmespilus* (in flower), *Gentiana pannonica*, *Carex firma* and *C. tenuis*. *Vicia dumetorum* was plentiful in the lower woods. I found *Laserpitium hirsutum* in the meadows; *Heracleum austriacum* in the upper woods.

There is a waterfall of considerable elevation in Hallstadt itself, presenting, in this wet weather, a good stream of water. About two miles up the valley, which opens just above the town, there is one, in every way more important. The first part is nearly perpendicular, for, I should suppose, three hundred feet, and the stream dashes down among broken masses of rock, for perhaps as much more. I gathered in the way *Cynanchum laxum* of Koch, and *Valeriana exaltata*, both rather doubtful species. The first I think I have met with more than once in France. It differs in having shorter stalks to the individual flowers, and in a disposition in the stem to be spiral, as if climbing at the top. The other has no extended runners to the root, but it must be observed here, as in the *Carices*, the peculiarity of the roots is not in their nature, but in degree, the side shoots of the roots rising immediately into stem, close to the old one in *V. exaltata*, while in *V. officinalis* they are extended first to a considerable length underground. In returning, I climbed up a bank composed of rubbish, brought down by a little stream from some of the branches of the Dachstein, the highest of the mountains about Hallstadt, and always retaining great masses of snow. Here, besides many other mountain plants, I found abundance of *Cerastium ovatum*. In this, as well as in many other Alpine plants found in similar situations, the crown of a fusiform root throws out abundance of equal slender stems, a mode of growth which seems essentially different from that above described as belonging to the *Carices*, and to *Valeriana exaltata*. These stems are covered up by stones and loose earth for a considerable distance, and they seem now and then to produce another root, which, like the original one, throws out a number of threadlike stems. *Cyclamen Europæum* is so abundant in all this neighbourhood, that the wood is often quite purple with its blossoms. *Helleborus niger* also continues very abundant, but, of course, at this season, there were only leaves.

I left Hallstadt on the 6th of August, hoping for better weather, and more productive mountains, in the neighbourhood of Salzburg,

and thus left what I might have done, for an uncertainty, and for what, in fact, never took place. I remained at Salzburg and its neighbourhood, including an excursion to Mondsee, from the 8th to the 17th, partly in hopes that the weather would improve, and permit me to visit some of the snowy mountains which I saw about me, and partly to obtain my trunk, which, in order to have as little incumbrance as possible in my mountain rambles, I had sent from Linz. I had delivered it to the people at the inn, at Linz, on Friday, the 2nd of August: it was not ready till past six in the evening, and they assured me that the office would be closed, but promised it should be sent on in the morning by the diligence, and it was not till my arrival at Salzburg, that I learnt that the diligence would not take parcels weighing above three pounds, and that consequently my luggage would be given to the baggage-wagon (Führ wagon), and that this baggage-wagon went only once a week, passing through Linz on the Friday night: I took one or two walks about Salzburg, and observed *Laserpitium Siler* and *latifolium*, and *Carduus personatus*. Of *Cirsium rivulare*, which is said to be very abundant in the meadows, I saw only one specimen, and that was near Mondsee. It is probably cut down in mowing the meadows, and does not reappear. I made also a trip to Mondsee, and in company with Mr. Hinterhuber, of that place, up to the Chalets on the Schaffberg, but the fog was so dense, and so continued, that after passing the night in a hay-loft, we could do nothing but walk down again. At Mondsee I gathered *Scrophularia Neesii*. This seems, in that neighbourhood, to occupy the place of *S. Ehrarti*, from which, perhaps, it is not distinct. The *S. aquatica* of the German botanist, is what in England has received the name of *S. Ehrarti*, while our *aquatica* is by them named *Balbisii*, and is a much scarcer plant. Many mountain plants come down in the woods quite to the shores of the lake, but of course these were completely out of flower; *Aconitum formosum* and *A. flexuosum* of Reichenbach also grow near the lake, and *Galeopsis pubescens* is abundant. On the Schaffberg grow *Lycopodium annotinum*, *Pyrolas*, *Campanula Scheuchzeri* of Koch., *Ranunculus lanuginosus*, and several other mountain plants, which, at the height I reached, were out of flower. Another excursion was to the Kugelmühl, at the foot of the Untersberg. I went on a fine evening, in hopes of being able to spend two days in exploring the mountain, which is said to be rich, and being above 6,000 feet high, always retains patches of snow, but rain and mist prevented me. The Kugelmühlen are merely little spinners in the Alpine stream, furnished by the Fürstenbrunnen,

where pieces of marble are reduced to a globular form, by being placed on a circular slab of marble, upon which turns a solid slab of ashwood of the same size. There is an extensive tract of peaty ground by the way, where *Andromeda polifolia*, *Vaccinium oxycoccus*, and many other bog plants abound.

I left Salzburg on the 17th, despairing of being able to visit the mountains, and perhaps was not very sorry that the wet weather continued as long as I remained at Munich. I was, however, able to revisit Harlacking, but found nothing new, and the *Saxifraga mutata*, which, in my former visit, was only just coming into flower, had now mostly discharged its seed. The meadows were full of a *Crepis*, which has the general appearance of *C. virens*, while the form of the fruit, and the spreading outer calyx seem rather to refer it to *C. biennis*. I was not sufficiently alive to it at the time, passing it over as a variety of *C. virens*, and neglected to take anything more than a single specimen as a memorandum. At Munich I went to the palace, and to the Au Kirche, which I had not seen on my former visit. The first contains, certainly, some very fine rooms, but, on the whole, I was rather disappointed, both in the rooms and in the paintings. The Au Church is a very beautiful edifice of German gothic, with the nave and aisles springing at the same height. This arrangement gives a very great height to the windows. The upper part of these has an ornamental pattern of coloured glass, admitting a good deal of light; the lower is enriched with paintings of the life of the Virgin Mary, to whom the church is dedicated, in rich and deep colouring, and very beautiful. Each window, and there are nineteen of them, is said to have cost £1,200. The boggy ground about Munich was too full of water to permit me to botanize upon it. The railroad passes through an extensive tract of it.

On the 21st of August I went to Augsburg. In the time of its prosperity, it was the fashion here to paint the outsides of the houses, sometimes with historical or allegorical subjects, sometimes with mere ornament, and a good many of these painted outsides still remain. The diminution of the population of Augsburg, during the last century, seems to be nearly equal to the increase of that of Munich. The immediate neighbourhood is flat. I attempted to reach some hills, of no great elevation indeed, but with woody slopes, which bound the valley, but I found myself entangled in a strip of boggy ground, which stretches along their feet, and had not time to get to them. In the meadows and bogs we find a mixture of our north of England botany, with plants of the Alps, and some of a warmer climate : among

the former were *Tofieldia palustris*, *Parnassia palustris*, *Primula farinosa*, *Pinguicula vulgaris*, *Sanguisorba officinalis*, *Geum rivale*; among the latter, *Cirsium oleraceum*, *Centaurea Jacea*, *Dianthus superbus*, *Schœnus ferrugineus*, *Gentiana utriculosa*, *Carduus defloratus*, *Polygala amara*.

I only slept one night at Augsburg, and set off the following evening for Stuttgart, where we arrived before twelve o'clock. I called on Mr. Lechler, and we set off for a walk, but the rain drove us back again. The next morning, however, we had a very interesting one; the slopes immediately about Stuttgart are covered with vines, a novel sight for one coming from Bavaria, but beyond these, there is a good deal of forest, where *Peucedanum officinale* and *Cervaria* are very abundant; we also gathered *Selinum Caruifolium*, *Laserpitium prutenicum*, *Campanula Cervicaria*, *Aster Amellus*, and *Geranium palustre*. *Cytisus nigricans* grow also here, and I apprehend this is nearly its most western station. *Sempervivum tectorum* grows on the walls of the vineyards, not perhaps indigenous, but perfectly naturalized, which it is not in England. *Sedum fabaria* is abundant, but I am not much inclined to admit its separation from *S. Telephium*, called by Koch *S. purpurascens*. *Vicia pisiformis* we looked for in vain, being apparently too late even for the seeds.

On the 25th I proceeded to Carlsruhe, where I found a very comfortable and reasonable hotel in the Darmstadterhof. Professor Döll conducted me to the *Galinsogea parviflora* and *Hieracium lævigatum*, but it was too late in the season to procure good specimens of the latter, and I could not observe the character insisted on by Koch, of the sort of crown formed by the outer scales of the calyx, when in the bud. In the afternoon we went to Durlach, where we got *Polycnemum majus* and *Euphrasia lutea*. On the 27th I went to Baden, and on the 28th, to Eslingen, where I got good specimens of *Lolium italicum*: this *Lolium* is clearly distinguished from *L. perenne*, by the young leaves, which are rolled up in the former, and folded flat in the common species. The plant is somewhat more slender, and of a different shade of colour, and the spicules rather more lax, so that the eye soon catches a difference in the general appearance. I afterwards went to Heidelberg, and stopped there at the Restauration, close by the railway, thinking it more convenient, as I wished to go off again early in the morning, and found myself very well pleased with my accommodations. I called on Professor Bischoff, and afterwards took a walk on the banks of the Neckar, but I found nothing.

The next morning I returned by the railroad to St. Ilgen, the first

station on the way to Carlsruhe, where I met Professor Döll, and we proceeded to investigate the productions of the long sandy tract which occupies a middle space between the hills of the Odenwald and the Rhine. We passed through Oftersheim and Schwetzingen, and hunted in vain for the *Corispermum Marschalii*. I think we found nothing which I had not already observed, except the *Fungi*, which were very numerous. *Serratula Pollichii* still offered tolerable specimens, but *Pyrola umbellata* was quite out of flower. The richest part of the tract seems to me between Friedrichsfeld and Mannheim, on the south side of the railway. The next day I got the Trapa, near Mannheim, in a piece of water, which was, perhaps, once, part of the bed of the Neckar, near the road from Mannheim to Seckenheim, but I found neither flower nor fruit. Afterwards I hunted in the Neckarau Wald, a woody tract near the Rhine, above Mannheim, but there was too much water to permit a successful search for the *Salvinia*, which was my principal object. *Stenactis annua* has much the appearance of having been sown, I know not why, on the bank which separates the waters of the Rhine from the marshy land within. In descending the Rhine, I determined to have one day more at Kreuznach. *Aster Amellus*, *Chrysocoma Linosyris*, *Peucedanum alsaticum*, and *Stipa capillata*, were my best things. After that I again had a little walk at Liege: *Carduus acanthoides* here approaches to the English form. In Austria the heads appear to be always solitary. On the Rhine they are generally so, while about Liege they are, perhaps, full as often clustered. *C. crispus* I did not see at Liege, but on the Rhine the heads are usually, but not always, two or three together. The three points of difference marked out by Koch are, the solitary heads of *C. acanthoides*, its somewhat more divided and more thorny leaves, and the web-like hairs which cover the under surface of the leaves in *C. crispus*, but which are said never to be found in *C. acanthoides*. On returning to Lewes, I find plants both with and without covering to the underside of the leaves, but the plants were too far decayed to permit me to determine whether it was possible to make out the two species of Koch. The plant which I got last year at Paris is not the German *C. acanthoides*, but a hybrid between *C. nutans* and *C. crispus* or *acanthoides*.

JOSEPH WOODS.

Lewes, January, 1845.

On Saxifraga rotundifolia. By THE REV. W. T. BREE, M.A., F.L.S.

IN the 'Phytologist' for January (Phytol. ii. 3) Mr. Borrer states the particulars of *Saxifraga rotundifolia* having been found by Miss White, two years in succession, apparently in a wild situation, near the foot of Causey Pike; and he very naturally and justly observes, that her "account encourages a hope that the plant may be truly a native of our mountains, although it does not establish it as such." He concludes his remarks by asking the question, "Can it be that it [the Saxifrage] had been purposely sown?" I should rejoice to hear of so interesting an addition being made to our native Flora; but of that, I fear, there is but slight probability. It may, perhaps, throw some light on the subject, if I state that so long ago as the year 1810, when I first visited the Lakes, I was informed by Mr. and Mrs. Hutton, of Keswick, that *Saxifraga rotundifolia* had been found near that place; I think also that they showed me a dried specimen, but of this I will not be quite certain; the particular place, too, where the plant had been met with, was mentioned, but at this distance of time it has entirely escaped my memory: indeed I paid the less attention to the narration altogether, and did not go in search of the plant myself, because my informants, at the very time they stated to me the above fact, candidly acknowledged that the plant was not really a native of that district, but had been planted in the situation where the specimens had been gathered.

It was during the same visit to the Lakes, that I was agreeably surprised by finding a single small specimen of *Saxifraga umbrosa* on the celebrated Bowther Stone, in Borrowdale, which I gathered, and at first treasured up as a genuine native plant, until I learned, as I very soon did, that a few years before, some one had been ornamenting this singular rock by planting garden flowers thereon; thus leaving me in no doubt whatever, that my starved though cherished specimen of London Pride, was but the remnant of such adventitious embellishments.

One thing, then, I think, may be regarded as certain: that previously to the year 1810, botanical frauds (so to call them) had been practised in the neighbourhood of Keswick, and that some one or other had been in the habit of planting garden species in apparently wild situations of that district. Whether Miss Wright's *Saxifraga rotundifolia* be a true native, or merely an exotic introduced to the mountains by the hand of man, it would, of course, be presumptuous in me to pronounce. I have, however, very strong suspicions, if the

truth must be spoken, that it is of the latter character. But at all events, botanists will do well to be on the look out for the plant in the Lake district.

W. T. BREE,

Allesley Rectory, January 23rd, 1846.

Note on Lastræa recurva. By The REV. W. T. BREE, M.A., F.L.S.

WHILE the pen is in my hand, I cannot resist the inclination I feel to offer a few remarks suggested by the perusal of the notice of Newman's 'British Ferns,' in the last number (Phytol. ii. 21), and by that of the review of the same work in the 'Annals and Magazine of Natural History' for December, (p. 427). The writer of the last-named article admits that the much disputed fern, *Lastræa recurva*, is, he now thinks, "a good species." This is so far satisfactory to my mind, as I have ever from the first believed it to be distinct, even in spite of high authorities to the contrary. But he objects vehemently to the specific name, "*recurva*," as being quite incorrect, and "conveying a totally wrong idea of the character of the frond, the whole and every part of which is more or less *incurved* (the edges turning upwards), never *recurved* or turned downwards." Allow me to ask — I would not do so arrogantly, but for the sake of information, — whether "*recurvus*" necessarily signifies bent *downwards* and not upwards? If so, is it not a rather arbitrary restriction of the meaning of the word? The dictionaries give as its signification simply "crooked" or "bent back," &c., not confining its sense to an inclination in either direction. A certain bird, well known to naturalists, without any imputation (so far as I know) of passing under a misnomer, bears the very appropriate appellation of "*Recurvirostra*," from the singular circumstance of its bill turning *upwards* in a very unusual manner, and precisely in the same direction as do the edges of the pinnules of the fern in question. At all events, I trust that the specific name "*dumetorum*" will not be retained for our *Lastræa*, as the writer of the article in the Annals suggests it should be; since that would lead to confusion, the specimens preserved in Smith's herbarium under that denomination, avowedly, it seems, "not agreeing with it." It may be added, too, that the name "*dumetorum*" is not sufficiently distinctive, and might with equal, and even far more propriety, be applied to other species. Should "*recurva*" be deemed so incorrect as to be inadmissible, would the writer of the article in the Annals approve of "*incurva*" being substituted in its place? I confess I should wish

to see the fern distinguished by a name expressive of the peculiar curvature of the frond, which is the obvious and most striking character that first meets the eye of the beholder, whether any choose to express this character by the term *recurva*, *incurva*, *concava*, or what not.

W. T. BREE.

Allesley Rectory, January 23, 1845.

Notice of the 'Supplement to English Botany,' Nos. 59—62, inclusive.

WE regard the 'English Botany' as so completely a standard and sterling publication, that we always have great pleasure in contributing our aid, however inefficient, in the endeavour to increase the sale of the Supplement. No portion of the original work was prepared with greater care, or evinced more consummate knowledge of the subject; and none of the plates have exhibited greater accuracy or beauty;—than are displayed in the numbers published during the past year. Our limits prevent our giving much more than a list of the species figured.

2879. *Conferva Brownii*. The description is by the Rev. M. J. Berkeley, who informs us that the plant was originally found by Mr. Brown, in a cave near Dunrea, in the north of Ireland: it has since occurred in the county Wicklow; and Mr. Ralfs has met with it on the Cornish coast. Mr. Harvey (Man. Brit. Alg. 134) compares it to *Conferva ægagropila*.

2880. *Atriplex rosea*. Mr. Babington, who describes this Linnæan species, thinks it has usually been confounded with *A. patula* by English botanists. It is common on the sea-coast throughout Britain.

2881. *Polysiphonia pulvinata*. This is the *Conferva pulvinata* of Roth. It has been found at Port Stuart by Mr. Moore; at Milltown Malbay by Mr. Harvey; and on the Devonshire and Cornish coasts by Mrs. Griffiths and Mr. Ralfs. The description is from the pen of the Rev. Mr. Berkeley.

2882. *Polysiphonia thuyoides*. This *Conferva* was first described by Mr. Harvey in the 'Flora Hibernica,' part iii. p. 205. The habitat (Cornish and Devon coasts) is omitted. The description of this species is also contributed by Mr. Berkeley.

2883. *Rubus glandulosus*. Mr. Borrer we believe to be the contributor of the excellent and detailed description of this "remarkable and beautiful bramble." It is an old continental species, and common in various parts of Europe, but was first discovered as British by

our able correspondent, Mr. R. Spruce, in a plantation on Terrington Car, near Castle Howard, Yorkshire, where it grows among rushes on a moist peaty soil, covering about a rood of ground, almost to the exclusion of every other bramble.

2884. *Epipactis ovalis*. This is the *E. latifolia*, β . of Smith's 'English Flora,' iv. 41. Mr. Babington, both in his Manual and in the present paper, gives it as *E. ovalis*. It occurs on stony slopes of rubbish, at the base of limestone cliffs, on the mountains near Settle, in Yorkshire.

2885. *Carex Buxbaumii*. This species, apparently well known on the continent, was discovered as British by Mr. Moore, upon a small island in Lough Neagh, near Toom Bridge, flowering in June. Dr. Boott states that the original Lapland specimens of *C. canescens* belong to this species, and therefore that that name should be retained. The description is by Mr. Babington.

2886. *Eriophorum gracile*. Another well known continental species, first found in Britain near Croft, in Yorkshire, in 1825, by Mr. Woods; and subsequently in Surrey, at Whitemoor Pond, half way between Guildford and the Woking station of the South-western railway, we believe by Mr. Borrer, who contributes the detailed and admirable description.

2887. *Phascum Floerkeanum*. Found in 1840 by Mr. R. B. Bowman, of Newcastle, on the Durham coast, in fields about half way between Sunderland and South Shields, and subsequently by Mr. Thornhill, in fields one mile from Ravensworth Castle, Durham. It is an old species, bearing the same name in Weber and Mohr's admirable little Taschenbuch, p. 70, and in other continental works. Mr. Wilson is the describer of this and the following species.

2888. *Grimmia orbicularis*. Mr. Wilson first discovered this species as British, on Orme's Head, in 1826. Mr. Eagle and Mr. Thwaites subsequently found it on St. Vincent's Rocks, near Bristol. It much resembles *G. pulvinata*, but is really distinct.

2889. *Callithamnion barbatum*. This beautiful little seaweed, previously described by Agardh and Harvey, was discovered by Mr. Ralfs at Ilfracombe, and on the quay at Penzance, forming densely tufted deep red patches on mud. The Rev. Mr. Berkeley contributes the description.

2890. *Arenaria uliginosa*. The discovery of this little plant in Yorkshire has frequently been noticed in our pages, where also its various synonymes have been given. The description is by Sir W.

J. Hooker, who remarks that its nearest allies in the British Flora are *Arenaria verna* and *A. rubella*.

2891. *Saxifraga umbrosa*, *δ. serratifolia*.

2892. *Saxifraga elegans*. These plants are figured from specimens under cultivation in the College Botanic Garden at Dublin. The descriptions are by Mr. Babington.

Notice of the 'London Journal of Botany.' No. 37, January, 1845.

This number contains the following papers.

'A Note upon the Genus *Sarcobatus*, *Nees*.' By Professor Lindley, Ph. D., &c. &c.

'Plantæ cellulares quas in Insulis Philippinensibus a cl. Cuming collectæ recensuit observationibus non nullis descriptionibusque illustravit C. Montagne, D.M.'

'Characters of two new Plants discovered in British Guiana;' by the Chevalier Robt. H. Schomburgk, K.R.E., &c.

Under the head of 'Botanical Information,' we find an agreeable and readable portion of a 'Journal of a Botanical Mission to the West Indies in 1843-4, by William Purdie, collector for the Royal Botanic Garden at Kew.' This article also contains, as usual, notices of new botanical works.

'Decades of Fungi,' by the Rev. M. J. Berkeley, M.A., F.L.S. Those now published are Australian.

Notice of 'Mycologia Britannica, or Specimens of British Fungi.'

By PHILIP B. AYRES, M.D. Fasc. 1, 4to. Pamplin, London.

WE have derived much pleasure from the examination of the 1st fasciculus of this useful work, the publication of which was announced on the wrapper of our January number. It contains specimens of fifty species of minute parasitical Fungi, belonging to the following genera: — *Puccinia*, *Æcidium*, *Erysiphe*, *Uredo*, *Aregma*, *Dothidea* and *Botrytis*. Each species has the scientific and English names, locality, time of perfection, and reference to the description in the second vol. of 'British Flora.' The specimens are beautifully preserved and neatly mounted. We wish the work all the success it deserves.

Note on the rediscovery of Malaxis paludosa at Tonbridge Wells.

By MR. EDWARD JENNER, A.L.S.

MAY I be allowed to add a few words to Mr. Sharp's paper on this subject in your last number, (Phytol. ii. 42). *Malaxis paludosa* must be considered as a rare plant in the South of England. I am acquainted with only four habitats in Sussex, namely, Chiltington Common near Pulborough, where the late Mr. Dickson found it long ago, and where it still exists; two stations on Ashdown Forest; and the one mentioned by Mr. Sharp, where I saw it growing in September last. I have never heard of a single locality in Surrey, or in Kent, since the time of Ray, when it is said to have been found in Romney Marsh.

To an ardent botanist — a true lover of Nature — there is doubtless unspeakable pleasure in finding a new station for a rare plant; but how much greater to such a one the pleasure in seeing, season after season, a rare or interesting plant in its native habitation! I am therefore by no means surprized at the rapturous exclamation of Mr. Sharp, at the rediscovery of Ray's habitat for the *Malaxis*.

EDWARD JENNER.

Lewes, December 17, 1844.

Notice of the 'Transactions of the Botanical Society of Edinburgh,'
Vol. i. part iii. Edinburgh: Maclachlan & Co, London: H. Baillière, and W. Pamplin. 1844.

ANY detailed notice of this part of the Transactions (which completes the 1st vol.) is rendered unnecessary by the ample Reports of the Society's Proceedings, which now appear in our pages. We have, however, marked a few particulars, not noticed in the Proceedings, which we trust will not be uninteresting to our readers.

The first article in the part before us is the paper on the Vegetation of the Outer Hebrides, by Prof. Balfour and Mr. Babington, previously noticed, (Phytol. i. 135). The value of this contribution to science will be understood, when it is considered that so little had this group been explored with regard to its botanical productions, that "*not a single* reference to them appears in Mr. Watson's '*New Botanist's Guide*.' Indeed, it would seem that a considerable portion of the group, is almost a *terra incognita*, not only to botanists, but to

tourists generally; for our party "were quite unable to obtain the slightest information concerning the Long Island (as the whole group from Barra Head to the Butt of the Lewis is collectively denominated), upon the mainland of Scotland, or even in any part of Skye. No person from whom we were able to inquire, and the number was far from being small, could inform us if we should find any inns, roads, or resident gentlemen in the Long Island, and we were therefore the more surprized and gratified by finding comfortable inns at Obb, Tarbet and Stornoway; to walk along excellent roads in most parts of North Uist, Harris and Lewis; and to be received with kindness and the most liberal hospitality by numerous resident gentlemen."—p. 135.

Near Ord, in Skye, were seen considerable remains of natural wood, consisting chiefly of *Betula alba*, *B. glutinosa* and *Alnus glutinosa*. At Camisunary the party gathered "a remarkable variety of *Oporinia autumnalis*, of very large size, and with the peduncles and involucrem densely clothed with slender, greenish-black, crisped hairs." By the road-side between Sligachan and Bracadale was noticed a curious form of *Taraxacum*, resembling that usually called *T. palustre*, but with the notches of the leaves reflexed, and the outer bracts lanceolate-attenuated; the direction of these bracts is not mentioned, but we presume they were erect. This plant could not be referred to any of those described by DeCandolle; the authors however consider that nearly all his *Taraxaca vera* are forms of one variable species.

The following extract relates principally to one of our most interesting plants, now, we fear, entirely lost to Britain.

"On our way from Tarbet to Stornoway, we visited the Shiant Islands, which are remarkable for their grand basaltic columns and lofty cliffs. It is stated in all our later Floras, that the *Menziesia cærulea* was found on them by the late Mr. G. Don; and we therefore examined them with great care, in the hope of finding so rare a plant, confirming a doubtful station, and proving the present existence of this beautiful heath as a native of Scotland. We say present existence, as it must be well known to most of the members of this Society, that, owing to the misconduct of a nurseryman, who dug up all the specimens that he could find, amounting, it is said, to nearly a cart load; it is supposed to be now quite extinct upon the Sow of Athol. We were however totally unsuccessful, and have every reason to believe that the *Menziesia* is not an inhabitant of the Shiant Isles, but that some mistake has caused it to be reported to grow there. We found *Empetrum nigrum* on the higher parts of one of the islands; and as that plant has once already been mistaken for *Menziesia*, we may be perhaps allowed to suspect a similar error in the present case, more especially as it seems probable that Mr. G. Don never visited the islands, but that he sent information of the discovery to Sir J. E. Smith, upon the authority of Mr. De Ramm, whose name is joined with his own in the 'English Flora.' Mr. Kippist, at Mr. Babington's suggestion, has examined the specimens in the Smithian Herbarium, and reports that the

only native specimens of *Menziesia cærulea* in that herbarium, are three little scraps, marked in Sir James Smith's handwriting, as from 'the Western Isles of Shiant,' but without any mention of the person by whom they were collected. Smith has left no memorandum on the subject, either in his herbarium, or in the interleaved copy of his 'English Flora.' Professor Don, who has seen the specimens, does not think they were sent by his father."—p. 141.

In the Shiant Isles, our tourists were much struck with the luxuriant growth of many of the plants; some specimens of *Carex binervis* "were full five feet in length, and had small spikes produced in the place of the lower flowers of several of the fertile catkins. Many of the spikes were male in the upper half and female in the lower."

Juncus balticus was gathered in profusion at Barvas; where also *Petasites vulgaris* was observed to be very abundant, and its roots are given to cattle in the winter months.

On the northern shore of Loch Maree, at Polewe, in Ross-shire, *Arctostaphylos Uva-ursi* was seen in abundance, "descending almost to the edge of the water; and in one place there are the remains of a forest of *Pinus sylvestris*, *Quercus Robur* and *Populus tremula*, occupying the clefts and ledges of lofty and almost perpendicular rocks, rising directly from the water. Many of the noble fir-trees assumed the most picturesque forms, spreading their stems, branches and roots over the face of the rock, in a truly remarkable manner."

The next article is a Catalogue of the plants collected in the above excursion. The list, including varieties, consists of 325 flowering plants, 23 Filices, Lycopodiaceæ and Equisetaceæ, 50 Mosses, 11 *Jungermannia*, 27 Lichens and 24 Algæ. A great proportion of the plants are species looked upon as common by the English botanist. By observations made in this excursion, the northern range of the following plants, in degrees of latitude, has been ascertained to extend beyond that previously recorded. Namely:—*Ranunculus sceleratus*, $\frac{1}{2}^{\circ}$. *Sinapis alba*, $\frac{1}{2}^{\circ}$. *Sagina maritima*, $\frac{1}{2}^{\circ}$. *Callitriche pedunculata*, $4\frac{1}{2}^{\circ}$. *Daucus Carota*, $\frac{1}{2}^{\circ}$. *Myosotis cæspitosa*, 2° . *Atriplex erecta*, 6° . *Rumex aquaticus*, 2° . *Salix alba*, 1° . *S. viminalis*, 1° . *Potamogeton oblongus*, 6° . *Avena strigosa*, 1° .

We have already given a long extract from the Rev. J. E. Leefe's, paper 'On the Groups Triandra and Fragiles of the Genus *Salix*,' (Phytol. i. 175). The author describes at some length the species of these groups believed by him to be distinct.

For reports of Dr. Dickie's papers on the occurrence of *Gelidium rostratum* at Aberdeen, and on the presence of iodine in certain maritime plants, see Phytol. i. 239 and 463.

'On the Development of Leaves,' by Dr. Dickie. We have not space to give the arguments adduced by the author in support of his opinion already quoted (Phytol. 528), they appear, however, to be worthy of consideration.

'Remarks on the Mode of Growth of the British Fruticose Rubi; and the Forms derivable from *Rubus cæsius*. By Edwin Lees, F.L.S. &c.' Mr. Lees states that in the course of his observations on these puzzling plants, he has found the term *biennial* altogether misapplied, since, with the exception of *Rubus Idæus*, he believes that none are limited in their duration to *two* years, "and even that species, when not under cultivation, often exists *three* years before it dies."

A fine barren shoot of *R. fruticosus*, springing from the hedge of Mr. Lees' garden at Forthampton in Gloucestershire, had penetrated a mass of ivy against a summer-house, the wood-work of which stopped the progress of the bramble-shoot at some distance from the ground. "A knob of fibrous roots was formed as usual, but being unable to enter the earth, they died. The following season, this barren shoot, instead of producing *flowering* branches, as I expected, shot forth a number of long *barren* shoots, commencing from the extremity of the old barren stem where the roots had died, and so on to its origin with the parent stem, which was still in a state of flourishing existence, having *flowered*, and shot forth barren shoots also. So that here was a *Rubus* of *at least* three year's growth, *still throwing out barren branches*." The barren shoot, on the following year, produced many branches, probably fertile; but Mr. Lees left the neighbourhood before he could ascertain this point. The author has "since examined a multiplicity of brambles, of almost every assumed species," and almost without exception finds their period of growth to be at least *triennial*, while in many instances the original stem lasted four, five, or even six years.

The author then explains six modes of growth of the fruticose Rubi, his observations on which seem to demand the attention of botanists; but as some of them would be scarcely intelligible without the illustrations, we refrain from quoting them, and prefer giving Mr. Lees' remarks on the supposed hybridity of some forms of bramble.

"It has been often gratuitously supposed, that the numerous forms of fruticose Rubi are due to *hybridity*; and at a first glance at the subject, this might seem a reasonable supposition:—but after an attentive examination of some years, I have never yet met with a decided and unquestionable hybrid bramble, and I believe none exist in a state of nature. I have searched diligently for such in woods abun-

dantly stored with *R. Idæus*, *suberectus* and *Kœhleri*, in juxta-position, but could never meet with even a suspicious specimen; and no one has ever noticed any step between *R. Idæus* and other fruticose brambles, where the hybrid, if in existence, would be so easily distinguishable.

"I therefore consider that the numerous forms of the fruticose *Rubi* are due to situation, aspect, age, and luxuriance of growth; so that it becomes useful to trace, if possible, the changes that circumstances may cause in one species. With this view I have directed my attention to the vitality existing in the stems of brambles, which I find far greater than usually supposed, or hitherto recorded, and thus the very great difference apparent in specimens of the same species is accounted for, as well as the difficulty that often presents itself in determining dried specimens."—p. 177.

'On two new Species of *Jungermannia*, and another new to Britain. By Thomas Taylor, M.D., Dunkerron.'

1. *Jung. punctata*, Taylor. "Caule cæspitoso, erecto, ramoso; foliis subapproximatis, rotundato-ovatis, apice atque hinc margine spinoso-ciliatis, recurvato-convexis; calycibus axillaribus, ex angusta basi late obovatis, compressis, hinc longioribus, illinc fissis, ore aperto spinoso-ciliato."—p. 179.

Woods at Cromaglow and mountains of Kerry, abundant. Long confounded with *J. spinulosa* (*Dicks.*), but differing in its smaller size, its patent leaves, which are less decurrent on the upper side, more rounded, and with punctate cells; and by its more densely and deeply ciliated shorter calyces.

2. *Jung. exigua*, Taylor. "Caule cæspitoso, adscendente, subsimplici; foliis rotundato-obovatis, patentibus, remotiusculis, integerrimis, apice bifidis, segmentis acutis.

"At Cromaglow, at Glenflesk, and in the mountains, co. Kerry." Closely allied to *J. tridenticulata* (*Taylor, MSS.*).

3. *Jung. tricrenata*, Wahl. "Caule erecto, subramoso, cæspitoso, flagella demittente; foliis patentibus, ex lata basi ovatis, acutis, apice bifidis, integrisve, convexis, subimbricatis; stipulis minutis obovato-rotundatis, subintegris; fructu axillari; calycibus lineari-oblongis, acuminatis, ore quadripartito.

"*J. tricrenata*, *Wahlenb. Flor. Carpatorum*, p. 364. *Lindenberg, Synops. Hepat. Europ.* p. 43. *J. trilobata*, β . minor, *Web. & Mohr*, p. 410. *Hook. Brit. Jung. \beta. et \gamma. t. 76, f. 4, 7. J. deflexa, Mart. Er-lang. 135, t. 5, f. 8, (vide Lindenh.) Spreng. Syst. iv. p. 221.*"

"In woods and on mountains in the south of Ireland." Differing from *J. trilobata* (*Linn.*), in its smaller size, its rufous tinge, its erect stems, and its acute, convex and minutely bidentate leaves, which are less imbricate and point forwards; the calyces too are acuminate and split into four segments; the peduncle to the capsule is shorter; the stipules more entire; the perigonia nearly spherical, and the perigonial leaves divided half way down.

The following remarks on the *Jungermannia* are valuable. "Nature has distributed her characters to certain genera so that they contain but a few species; to others so, that they embrace a vast multitude. Such last appears to be the case with the *Jungermannia*, whose numbers, however inconvenient, are to be parcelled out into new groups with the extremest caution. We only deceive ourselves by an imaginary convenience, if we are satisfied with weak or inconstant characters in forming new genera. When Nature has linked the species, it is perhaps worse than useless to attempt to separate them. *Jungermannia exigua* has strong claims to be considered allied to *J. excisa* (*Dicks.*), on the one hand, and to *J. tridenticulata* on the other, which last it is still held to be by acute botanists. Again, *J. tridenticulata* is still retained as a variety only of *J. spinulosa* (*Dicks.*) by Lindenberg, in his great work on the *Hepaticæ*, now publishing. But how unlike are the extremes of this series of four species! and what advantage can be expected from the separation of these extremes into different genera? It is not because a genus is large, that therefore it should be partitioned. Although the frondose *Jungermannia* seem to have constant characters, by which they may be separated from the foliaceous; and, again, a small tribe of these having an irregular dehiscence of the capsule, may be grouped aside, yet for the main body no constant and exact characters of subdivision, though long looked for, have as yet been discovered."—p. 180.

For Mr. Gardiner's 'Account of two Botanical Visits to the Reeky Linn and the Den of Airly,' see *Phytol.* i. 898.

A notice of Mr. Edmonston's 'Remarks on the Botany of Shetland,' is given in *Phytol.* i. 185; and at pp. 189, 191, 239, 266, 493, 526, and 651, will be found full reports of all the remaining shorter papers contained in this part of the Transactions, the contents of which are equal, in value and interest, to those of either of its predecessors.

On the Branch-bearing Leaves of Jungermannia juniperina, (Sw.)
By MR. RICHARD SPRUCE.



Branch-bearing Leaves of *Jungermannia juniperina*, magnified.

SHORTLY after my return from an excursion to the South-west of Ireland, in the summer of 1842, having occasion to examine some fine specimens of *Jungermannia juniperina* (Sw.), collected in company with Dr. Taylor, at Cromaglow, on the 13th of July, I noticed that at the summit of one of the stems, the leaves were so closely crowded together as to form a sort of coma; and that from amongst these leaves, which were spread out on every side and recurved, there proceeded several minute branchlets, some nearly erect, others gracefully pendulous, resembling in miniature the flagelliform ramuli of *Mnium undulatum*, Hedw. (*Bryum ligulatum*, Musc. Brit.). I immediately placed the specimen under the microscope, and proceeded to dissect it; but what was my surprise to find that the branchlets issuing from the coma, instead of being attached to the main stem, *actually grew on the surface of the leaves*, where they had all the appearance of having been stuck on by art! Each of the comal leaves bore at least *one* branchlet, but some of the central ones *two*, not confined to any particular point of the surface of the leaf, except that they never arose from the lobes; and they were clad with leaves and stipules precisely like those of the stem, though of course very much smaller, for the whole branchlet rarely exceeded in length the leaf on which

it grew, and in one instance only have I seen it thrice as long. The base of each branchlet is slightly dilated into a sort of bulb, which is affixed to the leaf by a very small surface (covering exactly *one* cellule), and when detached by gentle force, it brings away with it the upper paries of the cellule. In no case have I been able to detect any radicles proceeding from the base of the ramulus, and connecting it with the leaf; and sections that I have carefully made of the leaf and ramulus at the point of attachment, have failed to reveal any peculiarity of structure.

I have kept my sketch and notes of this remarkable monstrosity (for such I considered it) laid aside for upwards of two years, hoping that I might meet with some analogous structure in other species of the genus, or in other tribes of plants, which would lead to a correct explanation of the mode of its production; but in this I have hitherto been disappointed. There can be little doubt that the matter from which these branchlets are organized, exists in the cellules from which they spring; and perhaps their formation may be accounted for by regarding them as gemmæ, which have developed into distinct plants while yet remaining in adhesion to the parent stem. It is true, that, so far as I am aware, this premature growth of gemmæ has never been observed in the tribe of Jungermanniæ, yet there is something very similar in the Marchantiæ; and in some genera of Lichens we find gemmæ arising from the surface of the thallus, and developing into perfect plants, whose connexion with the parent plant is very tardily — sometimes *never* — dissolved. It is to be regretted that I was unable to meet with a leaf-branch of *Jungermannia juniperina* just bursting from its cell, which would probably have afforded a clew to the cause of its appearance in such an unusual locality; but all that I have seen were considerably protruded, and, in all that regards their structure, fully formed.

RICHARD SPRUCE.

Welburn, near Whitwell,
Yorkshire, January 31, 1845.

On Ceradia furcata. By PROF. BALFOUR.

You will see in Lindley's Register for February, that the plant from Ichaboe, noticed by Dr. Maclagan at the January Meeting of the Botanical Society of Edinburgh (Phytol. ii. 60), is *Ceradia furcata*, belonging to the natural order Compositæ, and section *Erechthitæ*. I have lately received a specimen of the plant in a better state than that noticed by Dr. Maclagan.

J. H. BALFOUR.

On the Yellow Juice of Ceanothe crocata. By J. H. BALFOUR, M.D.
Professor of Botany in the University of Glasgow.

In the last number of the 'Phytologist,' I observe that there is a question put by Mr. Mill, as to the *yellow* juice of *Ceanothe crocata*, (Phytol. ii. 48).

It is quite true that on cutting across the roots of *Ceanothe crocata* in the fresh state, there is no appearance of a yellow juice; but after short exposure to the air and absorption of oxygen, I have frequently seen the juice assume a yellowish or brownish tinge. In this way we may probably account for the statements made by different botanists. As to the *acrid* nature of the juice, I cannot speak from personal observation.

It is curious to remark, in regard to the roots of this plant, that in some localities they seem to be innocuous, while in others they are decidedly poisonous. This has been distinctly shown by the experiments of Prof. Christison. The juice of the roots of plants growing in the neighbourhood of Edinburgh, had no effect when given in large quantities to animals; while that from the roots of plants growing near Liverpool, acted as a poison. Peculiarities of soil or climate would appear to modify, in a remarkable degree, the properties of many reputed poisonous plants. Dr. Christison read an interesting paper on this subject before the Royal Society of Edinburgh, and he has illustrated it by reference to *Ceanothe crocata*, *Cicuta virosa*, and other plants.

J. H. BALFOUR.

11, West Regent St.,
Glasgow, Feb. 7, 1845.

Observations on the Genus Rubus. By T. BELL SALTER, M.D., F.L.S.

AT the close of my remarks on the Botany of Selborne (Phytol. i. 1132), I forebore to make any comments on the Rubi I had obtained, not, as I then observed, because they were either few, or wanting in interest, but because they were still *sub judice*. Since that time I have carefully examined them, and under circumstances, as I shall presently show, which will enable me to speak of them with some considerable degree of confidence.

The genus *Rubus* had uniformly, and as if by common consent, been neglected by the earlier botanists. With regard to the investigation of our British species, nothing had been done until Bicheno

and Forster turned their attention to them, and the result of their labours, with the earlier efforts of Borrer, and those of the eminent author himself, are given by Sir James Smith in his elaborate Flora, until the appearance of which no British synopsis contained any attempt at discriminating them.

To Dr. Lindley we are indebted for a more decided step towards a precise knowledge of our native species, than had been taken by any of his predecessors. The clear, characteristic, and concise descriptions, condensed by him from the work of Weihe and Nees, are at the same time not only more precise, and recognizing many common forms, not before in our English books, but also were far more available, from their very conciseness, than the elaborate descriptions of Smith; and it speaks much for the correct observation of these justly celebrated authors, Weihe and Nees, that the circulation amongst British botanists, of these condensed descriptions of theirs, should, in a short space of time, have done more to make us generally acquainted with our own species of this genus, than all the previous efforts of our own botanists.

It would not be just, however, towards Dr. Lindley, to deny him any other praise than for the great service he did us, in making us acquainted with these authors; for although his subsequent engagements have led him to abandon the study of this genus, on which he had worked so successfully, this was not until he had recognized some new forms: and, though he did not pursue the subject till he had attained so accurate a knowledge as some who have followed him, the account of them in his Flora was yet the first approaching to much precision or completeness that had been published in this country, both as regards the enumeration of forms or species, and characteristic descriptions.

But probably no one individual in this country has devoted so much time and successful attention to this subject, as my excellent friend Mr. Borrer. He has done so, however, in a way characteristic of himself. Though he has published nothing, or very little, on this subject, yet much that is valuable in the works of others, derives a great portion of that value from the labours of Mr. Borrer, who is always ready to impart from his ample fund of information, and who, more than almost any one, successfully pursues the study of Nature without a thought of fame. In the British Floras of Smith, Hooker, and Babington, in the local Flora of Leighton, and in 'English Botany,' a large proportion of the information on this subject is from Mr. Borrer. For myself, I am indebted for an act of *private libera-*

lity from this gentleman, which fully deserves this *public* acknowledgment. As soon as he knew that I had been collecting and was examining Rubi, the whole of his valuable collection was instantly at my disposal; — a collection containing an immense number of specimens, and authenticating the opinions of nearly all who have studied the subject for many years. This is one of the circumstances to which I alluded at the commencement of this notice, as enabling me to speak of my Selborne specimens with some degree of confidence. Another of them is, that I had very lately the advantage of a visit from my friend Mr. Babington, who brought with him a large portion of his Rubi. The mutual comparison of specimens which we had thus an opportunity of making, is far more satisfactory and precise than endless reference to descriptions, even the very best; and indeed, better and more happy descriptions, given, too, as they are, in few words, and in a genus so difficult, cannot be imagined, than those of Babington. Certainly, no other analysis or description of the British species of this genus, approaches those of the Manual, either in comprehensiveness or perspicuity.

Another advantage which I had in looking over specimens with Mr. Babington, was, that he is well acquainted with the herbarium of Mr. Leighton, the accurate and laborious author of the ‘Shropshire Flora,’ to whom we stand indebted for the immense trouble he took in collecting large numbers of specimens, and sending them for authentication, not only to the most eminent botanists of this country, but to those of the continent also. There were many of these series of specimens, with memoranda of their various authentications, in the valuable collection of Mr. Borrer, kindly lent to me.

I mention the above circumstances, to show how far I have had an opportunity, in the remarks which follow, of authenticating and comparing the specimens of which I speak; and in doing so I must mention two other opportunities, namely, the donations of the Botanical Societies of Edinburgh and London. Those which I received from the Edinburgh Society were few in number, but excellent specimens, and correctly named: those from the London Society were much more numerous, but I cannot compliment either the specimens or the accuracy of their names.

I regret not having seen the herbarium of Mr. Edwin Lees, a gentleman, who, I am aware, has for many years paid great attention to the Rubi, and who cannot have laboured so much without arriving at some valuable results. But though I have not had the opportunity of knowing his opinions of species, except very imperfectly, from inci-

dental sources, I shall yet have occasion to allude to his very interesting remarks on the habits of Rubi, which have appeared in the late part of the 'Transactions of the Botanical Society of Edinburgh.'

One of the greatest difficulties in this difficult genus, is the assigning of the exact limits of species. There are often forms sufficiently marked and constant to require a clear discrimination from others, with which, however, they evidently *occasionally* osculate. They cannot on this account be considered specifically distinct, and yet there is an inconvenience in considering them mere varieties, because, like true species, these again have variations of form which require to be recognized. In the 'Manual of British Botany' by my friend Dr. Macreight, an attempt is made by the late eminent botanist, my lamented friend David Don, who, I am informed by the accomplished author himself, supplied this genus for the Manual, — to get over this difficulty, by distinguishing these forms as *sub-species*. This arrangement has not been accomplished with so much accuracy as I should have expected from one in general so accurate; but it is not of the *execution* of the task I now wish to speak, but of the *principle*. I confess there appears to me something contradictory in the very name of a *sub-species*; and I would rather recognize those forms which are really *not species*, as *varieties*; and when these again contain forms requiring notice, I would recognize and designate them as *sub-varieties*.* This appears far less objectionable, and would not very frequently require to be made use of.

It is almost universally believed of the Rubi, that they are plants with perennial roots, *producing biennial wood*; that the stems are, — to use the words of Lindley, — "sterile the first year, bearing flowers and fruit the second, and then perishing."† Even those close observers of these plants, the illustrious Weihe and Nees von Esenbeck, were of this opinion,‡ as well as all the authors of *our* various Floras.

* Somewhat in the manner of Mr. Borrer's analysis of *Rosa canina* in Hooker's Flora.

† Lindley's Synopsis, 1st. edition, p. 91.

‡ These are the words of the learned authors on this point. "Rubi, cum aliis plantis, his similibus, inter veras frutices, quorum caulis perstat, et plantas, perenni radice instructas, (seu caulocarpicas Decandollii), medium fere locum occupant, cum non nisi pars eorum ferat hyemem, omnivse, ut rem acu attingamus, surculus vitam biennem expleat; namque primo, quo surculi enati sunt, anno citissime crescent, et in eximiam longitudinem protensi, tandem ad lignosi fere trunci duritiem perficiuntur; tum altero anno flores ferunt fructumque, his autem peractis, pereunt. Hinc sequitur, cuicunque Ruborum frutici duplices quasi ordinis surculos futuros esse, quorum alios hornotinos invenies atque steriles, alios autem biennes, florequae et fructu gaudentes." — Weihe et Nees, 'Rubi Germanici,' p. 3.

I have for some time been aware that this is not always the case in *Rubus discolor* (*W. et N.*), and I have several times mentioned to my friends, that one variety of this species assumed a mode of growth very analogous to that of the genus *Rosa*; and some few months since I had been surprised to observe how much more usual was the budding of shrubs, which had previously fruited, than I was at all prepared to believe. While making observations on this point, the last part of the 'Transactions of the Botanical Society of Edinburgh' came into my hands, containing the interesting paper of Mr. Lees before alluded to. To this gentleman is certainly due the credit of pointing out a most remarkable and prevalent error respecting the habits of this very common genus. I have myself lately examined a large number of brambles, and I am, in common with Mr. Lees, persuaded that the general rule in the fruticose Rubi, is, that the stems are not biennial. Of *Rubus discolor*, I have carefully scrutinized a great number of plants; and I find very generally that those which have already flowered and borne fruit two years, are preparing to do so again; thus making the age of the shrub not *two* years, but *four at least*. I believe in no instance do buds remain dormant, and sprout from wood of more than one year's age, but that each year as long as the stem lasts, some barren shoots, as well as flowering shoots, are produced, from which the future shoots of both kinds proceed. The larger flowering shoots or panicles are also permanent, and while the flowering portion dies in the winter, the lower portion remains, and gives rise to other panicles, precisely as do the secondary barren shoots. The following I believe, in fact, to be the ordinary habit of *Rubus discolor* (*W. et N.*), the commonest of our English brambles.

The first year's shoot from the root is a very long barren stem, which roots at the end: the part nearest the end bears no buds, as a general rule, capable of producing shoots, but only of rooting; for I know, from very recent observation, that not only the extreme point, but also the buds near it, are capable of rooting, and occasionally do so. *The second year*, the extreme portion of the stem, that nearest the rooted point above mentioned, generally dies; the buds nearest this dead portion produce panicles of flowers, the extreme ones of ordinary size, but those nearer the root—the original root—are of larger size, with much branched inflorescence, and borne on very long stems, which, the flowering portion at the end having perished, remain till the following year, and produce panicles of ordinary size. Nearer still to the root, not panicles but barren stems are produced; these, though smaller than the original ones from the root, have all the general characters of primary barren shoots, and root at the end. *The*

third year, panicles and barren shoots are produced, but the latter are very short, and, I believe, never rooting; — to use the words of Mr. Lees, “the vital principle seems considerably diminished the third year, and so gradually dies out.” Beyond the fourth year of duration and the third of flowering, I have as yet noticed no *conclusive* instance, but Mr. Lees, whose attention has been longer directed to this point, mentions that their duration is sometimes continued to a much longer period.

I have chosen this species — *Rubus discolor* — from which to describe these habits, partly because I have had most opportunity of observing it of late, and partly because this kind of growth appears to be more developed in this than in some other species; still, I have sufficient opportunity for observing that the greater part at least of the ordinary species are by no means biennial only.

Perhaps the one most removed of all from that habit of growth now newly described, is *Rubus Idæus*, and this, probably almost without exception, produces stems which flower the *second year*, and then *perish*. I am informed, however, by my friend Mr. John Lawrence, the highly intelligent gardener at St. John's, near Ryde, of one point in which this species maintains some analogy with the others. He informs me that there is one variety, called the *double-fruited raspberry*, which produces flowers and fruit at the extremity of the *annual shoot*; the part which has flowered perishes, and the lower part persisting through the winter, produces lateral panicles the following year, as in the ordinary state of the plant. Here then we have an analogy to the circumstance of the lower part of a long panicle, for such an annual flowering shoot may be fairly considered, remaining till another year, and producing secondary ones; but I know of no instance of the stem of a raspberry producing the second year secondary barren shoots, although I have little or no doubt that under certain circumstances it would do so. There are always some buds lower than those which produce the flowering branches or panicles; there can be no reason to doubt that these would produce sterile shoots if the upper part were prevented from blossoming, and thus prolong the lower part of the original shoot till a third year. I have lately cut off all the blossom-buds of several plants, to ascertain if in this second particular also, this species will bear out the analogy with the arching forms. Perhaps some other of the readers of the ‘Phytologist’ would do the same, and thus assist me in ascertaining this point.

T. BELL SALTER.

Ryde, Isle of Wight, February 11, 1845.

(To be continued).

On the Cerastium latifolium (Linn.) var. *Edmondstonii* (Lond. Cat.);
and on the Seeds of *Cerastium latifolium* and *C. alpinum*. By
HEWETT C. WATSON, Esq., F.L.S., &c.

MR. EDMONDSTON has lately favoured me with two specimens of the Shetland plant which was described by that botanist as "a new British *Cerastium*," (Phytol. i. 497); and I have also seen others, which were sent to the Botanical Society. These specimens entirely confirm me in the opinions which were expressed in the same volume of the 'Phytologist,' in dissent from those entertained by Mr. Edmondston, namely, that the Shetland plant is an identical species with that of the Highland mountains, (Id. 586); and also that the Highland species is truly the *C. latifolium* of the Linnean herbarium, (Id. 717); anything written by Mr. Bentham or Mr. Babington notwithstanding. Mr. Edmondston's specimens are distinguishable from my other wild specimens, by their shorter capsules and usually (not constantly) broader leaves; which are the only characters to distinguish them, even as a mere variety, from the species of the Highland mountains. These slight differences may have some connexion with the low elevation at which the *Cerastium* grows in Shetland, compared with its position on the mountains of Scotland. Some of my garden specimens, dried the second year after the plants had been removed from the Grampians into the county of Surrey, scarcely differ from those of Shetland in length of capsule or breadth of leaves. The seeds of Mr. Edmondston's specimens correspond with those of *C. latifolium*, as described in the next paragraph.

While writing about the Shetland *Cerastium*, in the former volume of the 'Phytologist' (Id. 718), I mentioned incidentally that the seeds of these two species differed considerably; those of *C. latifolium* being smaller, darker and muricate; those of *C. alpinum* larger, paler, and simply rugose. On afterwards alluding to these two species, in the 'London Journal of Botany' (Feb. 1844), I expressed a suspicion that an accidental crossing of their names had occurred on the papers in which the seeds were folded. This suspicion is confirmed by other seeds, collected in my garden last summer; those of *C. alpinum* (not *latifolium*) being smaller and muricate, as well as darker in their colour. But I am not quite prepared to say that these differences cannot depend on the state of ripeness; the seeds of *C. latifolium* being less thoroughly ripened, and their skin being loose. Would this loose skin have contracted in such manner as to produce the elevated points

or tubercles, at the same time lessening the apparent size of the seed? It is to be wished that botanical tourists would compare the seeds of the wild plants. If constant, the difference in their surfaces will afford a good character between species whose near resemblance has led to many errors.

HEWETT C. WATSON.

Thames Ditton, February 12, 1845.

*Synonymes of *Ænanthe peucedanifolia* of Smith.*

By HEWETT C. WATSON, Esq., F.L.S., &c.

SINCE addressing to the 'Phytologist' (ii. 11) some observations upon this and the allied species, I have seen an *Ænanthe* among Hohenacker's Caucasian specimens, in the possession of Dr. Charles Lemann, which I take to be identical with Smith's species, and which is labelled "silaifolia." Unfortunately, this specimen has only very immature fruit, and wants the radical leaves; but its close resemblance to the English examples, at an equal stage of growth, leaves little doubt of their specific identity. Thus, if truly the "silaifolia" of Bieberstein, we may believe Mr. Ball quite correct in applying the same name to the species described by Smith under that of "peucedanifolia." That the latter is really the species of Bieberstein, is rendered probable from the reference of that author to the figure in 'English Botany,' 348; although some words in his description of the plant do interpose a difficulty. Moreover, Ledebour's diagnosis of *Æ. silaifolia*, in 'Flora Rossica,' almost exactly identifies the plant of the Crimea with our English species—taking the fruit as described by myself, not as described by Smith (from a wrong species), or by Ball (from specimens too immature, and possibly belonging to *Lachenalii*). It is likely that Ledebour fell into similar errors with the botanists of this country, and confused different species together. In the first volume of the 'Flora Taurico-Caucasica,' he gives one species only, under the name of "pimpinelloides;" though I suspect *Lachenalii* to be the species really intended. In the Supplement to the same work, he added a second species, his *silaifolia*, referring to the description and figure of Smith's *peucedanifolia*. And now (1844), in the new 'Flora Rossica,' Ledebour describes three species as natives of the same district—*Lachenalii*, *silaifolia* and *pimpinelloides*. I suppose, however, that the Caucasian *Lachenalii* and Taurian *pimpinelloides* may be identical; as it does not appear that Ledebour had seen any example of Bieberstein's "pimpinelloides," and the short character and refe-

rence (to 'English Botany' 347) for the latter, seem to imply a misnomer of *Lachenalii*. I am disposed to believe that the *Oenanthe incrassans* (*Bory and Chaub.*) is still only another name for the same species. Assuming these ideas correct, the plant has been named successively, *pimpinelloides*, *peucedanifolia*, *silafolia*, *incrassans* and *Smithii*,—without adding five other synonymes, which are given in Steudel's *Nomenclator*. HEWETT C. WATSON.

Thames Ditton, Feb. 12, 1845.

Notice of Gardiner's 'Botanical Rambles in Braemar in 1844.'

Wm. Gardiner, Overgate, Dundee, 1845.

WE have great pleasure in recommending this little pamphlet to the attention of our readers. Such of them as have participated in Mr. Gardiner's annual distributions of the gems of the Scottish Flora, will find in its pages a store of agreeable observations on the various interesting localities wherein those treasures have been collected: to such as have not hitherto made acquaintance with the author's valuable packets of plants, it will exhibit a pleasing picture of the botanical riches of a district abounding in scenery of the most splendid and romantic character. To the natural productions of one rich locality—the Sands of Barrie—Mr. Gardiner would gladly devote a separate treatise, provided he could obtain a sufficient number of subscribers to defray the expense of printing. He also contemplates an examination, during the coming season, of several localities not visited by him last year. We heartily wish Mr. G. every success in his literary and scientific labours.

Proceedings of Societies.

BOTANICAL SOCIETY OF LONDON.

February 7, 1845. Edward Doubleday, Esq., V.P., F.L.S., in the chair.

Mr. Edmondston presented specimens of the Shetland *Cerastium*, which occasioned some discussion among British botanists in the year 1843; Mr. E. then describing the plant as "a new British *Cerastium*" (*Phytol.* i. 497), identical with the Linnæan *C. latifolium*, but distinct from the Welch and Highland species, described under that name in the works of Smith and other English authors. Although differences of opinion were then stated respecting the Highland spe-

cies, it seemed generally agreed that the Shetland plant was properly referred to the *C. latifolium* of Linnæus. The specimens now presented to the Society, however, are labelled "*Cerastium nigrescens*, *Edmond. in Shetland Fl. ined.*" It would thus seem that Mr. Edmondston has changed his opinion regarding its specific identity with the Linnæan species. In the London Catalogue the plant is given as a variety (*Edmondstonii*) of *Cerastium latifolium*, (*Linn.*); but it may be doubted whether Mr. Edmondston's specimens can be distinguished from the Highland and Linnæan *C. latifolium*, even as a variety merely: there is certainly nothing in the form of the leaves to keep them distinct.

Mr. Edmondston also presented specimens of the Shetland *Lathyrus maritimus*, which has been considered a different variety (*acutifolius*) from the same species found on the coasts of England. Except in the more robust growth of the English specimens, there is little to distinguish those of Shetland from others collected in Suffolk by Mr. D. Stock. Far wider differences may be seen in the leaves of *Orobus tuberosus*, *Vicia sativa*, and others of our common Leguminosæ.

Mr. Newnham presented specimens of *Elatine Hydropiper* and *hexandra*, from the lately discovered locality near Farnham, in Surrey.

Specimens of *Lastræa spinosa* (*Newm.*) were exhibited, which had been selected from a number of others collected by Mr. Jabez M. Gibson, near Coggeshall, Essex. Two of the specimens having been obligingly examined, and the correctness of the name certified, by Mr. Newman, the Herbarium Committee had resolved to send out similar examples in each parcel during the current year; as the species usually is labelled "*L. dilatata*," by many botanists. In the London Catalogue, the name of "Roth" is inadvertently given as the authority for *Lastræa spinosa*, (copied from the 'Phytologist,' i. 836); but since Roth described the plant under the generic name of *Polystichum*, Mr. Newman is probably the first author who has applied Roth's specific name "*spinosum*," to the other generic name *Lastræa*.

Read, "Notice of the Botany of Thame, Oxfordshire, by Dr. P. B. Ayres." Specimens of the plants mentioned are deposited in the Society's collection.—*G. E. D.*

Erratum. — Phytol. ii. 64, line 3, for "*from* the Society's herbarium," read "*for* the Society's herbarium."

*Observations on the Genus Rubus; with a Notice of the Species observed during three days at Selborne.** By T. BELL SALTER, M.D., F.L.S.

(Continued from p. 92).

WITH that part of Mr. Lees' paper which has reference to the habits of Rubi, I fully accord, as the foregoing remarks sufficiently testify; but I must express myself as by no means coinciding with him in the remarks he makes, as to the extent to which those habits interfere with the generally received opinions of specific characters. I believe the only caution which becomes needful from this cause, is this, namely, not to look to small secondary barren shoots for the proper characters derived from this part of the plant, either in respect to its foliage, or the texture of its clothing,—these small shoots approximating in both particulars to those of the panicles. Thus they are, generally, in those species in which the panicles are tomentose, much more hairy than the proper growing shoots, and the leaves are generally much more simple. The older the shrub, and the smaller these barren shoots, the more do they in these respects approach in foliage and clothing to the characters of the panicle.

And this remark does not apply to the barren shoots of the second or succeeding year's growth only, but also, in some degree, to accidental branching during the first year. When a shoot meets with an accident to arrest its growth, it sends out many branches; and if, at the time of the occurrence, it was in vigorous growth, except that the first few leaves are more simple, these branches have all the characters of the primary barren shoots. If, however, these branchings take place later in the season, when the buds have been more matured, or

* In the first volume of the 'Phytologist' (i. 1132) I contributed a notice of a visit to Selborne, under the title of "Three Days' Botanizing at Selborne," in which I made mention of those plants of interest which I there met with, excepting the brambles, which I was not then prepared to speak of. The present notice of the Rubi found by me at that time, I had desired should have been considered as a continuation of that communication, and *with the same title*; and accordingly I sent the first portion of this renewed account of the results of my visit, headed as before,—"Three Days' Botanizing at Selborne." I had, however, prefaced the remarks on the Selborne Rubi, with some general observations on the genus, and these attained so great a length, that there was not room in that number to come to the consideration of those plants from Selborne which had led to my communication. On this account the Editor changed my title to "Observations on the Genus Rubus." As regards that portion of my paper, this may be a more appropriate heading, but not so to the whole; and therefore in the present and following parts, I restore a portion of my former title.

perhaps in consequence of being from buds originally intended for the next year's flowering, these secondary branches have a different habit, and become modified like those mentioned above, though in a less degree.

A remarkable instance of this resemblance of habit in a secondary barren shoot to some of the characters of the panicle, is represented in one of the plates in the work of Weihe and Nees, in which the truthfulness of the artist is wonderfully shown, — there being no notice of the circumstance in the text of the work. The sterile annual shoot of *Rubus nitidus* is bright and shining, but the panicle—though also with a shining rachis, and glabrous at the lower part — is hairy towards the summit. Now when, from any cause, in this species there arise small secondary barren shoots, these have precisely the same kind of hairiness as that of the panicle, and this is the instance in the work of Weihe and Nees to which I alluded. In Tab. iv. are represented a part of the vigorous growing shoot, quite glabrous, and one of these secondary ones; and in this latter may be seen, very faithfully represented, the character now spoken of.

Important however as I admit Mr. Lees' communication to be, as respects the habits of these plants, and involving the necessity of caution in the matter I have above mentioned, — to his further remarks, namely, the great modification of apparent specific character, I must take the most decided exception. The first instance Mr. Lees adduces, is that of *Rubus cæsius* becoming *R. dumetorum*. He states that "if it establish itself in a hedge, its leaves assume a firmer texture, its flowers are larger and more showy, but its beautiful fruit becomes of a dull purple, devoid of bloom or altogether abortive. In this state the great German writers on Rubi have given it the name of *dumetorum*, though it is impossible, on strict examination, to avoid noticing every state between the creeping *cæsius* and the erect *dumetorum*."* Mr. Lees is very explicit in speaking of the erect habit of the form he here calls *dumetorum*; but on referring to the work of Weihe and Nees, so far from finding them describe *dumetorum* as *erect*, I find that in this respect the stems of both it and *cæsius* are described in precisely the same words, "*caule procumbente*," yet Mr. Lees is equally explicit in stating that the *dumetorum* in question is that of the "great German writers." In fact, without at all contesting the point whether *Rubus cæsius* and *R. dumetorum* may not each of them, while supported, become more erect, or at all events more

* Transactions of the Botanical Society of Edinburgh, i. 176.

elevated, the latter, though stouter, is essentially as creeping a plant as the former, running along the ground, and rooting, not only from the terminal bud, but from others near it, as I had an opportunity of observing not many days since.

Again, in deriving, as Mr. Lees does, the *R. diversifolius* of Lindley from *cæsius*, there must also be some error. He says, "it is an erect and more exposed form, stouter, and with a greater abundance of glandulosity." Mr. Lees is again very explicit in stating that it is the *diversifolius* of Lindley of which he speaks; but on referring to this author's Synopsis, it will be found that so far from being "*erect*," Dr. Lindley's plant is "*arched*;" and that so far from there being a "*greater abundance of glandulosity*," it is not even placed in the same section with the glandulose species, nor, in fact, is it at all a glandulose plant. To this point, however, I shall have occasion to refer again, when speaking more particularly of the plants found at Selborne. Of Mr. Lees' third instance I am equally sceptical; but as I shall have occasion to speak of this also in my subsequent remarks on particular species, I will not here dwell upon it.

While on these general remarks, I would speak of one or two more points. The effect of shade I believe to be, in general, to make the plants more upright. With regard to hybridity, I believe, with Mr. Lees, that there is no reason whatever for supposing it to occur.

I have dwelt much longer than I intended on the general habits of these plants; and shall now proceed to refer more particularly to the specimens which have led me to make this communication, and once more turn my thoughts to the peaceful and picturesque retreats of the classic Selborne. The nature and general aspect of this district I have endeavoured to make known, in some degree, in my former communication; and from what was then said of the nature of the locality, it will readily be believed that the forms of *Rubi* may be numerous. With respect to my own expectations, they fell far short of my findings, a detail of which I now propose to offer to my fellow readers of the '*Phytologist*;' and in proceeding to do so, I propose to follow the same plan as in my former notice, namely, first to give a list of the species, with their localities, and then make such general or special remarks on each, as may suggest themselves.

The following are those observed:—

Rubus affinis, *W. & N.* In the Lith.

— *nitidus*, *W. & N.* Near the Priory.

— *discolor*, *W. & N.* Far less common about Selborne than in most localities.

- Rubus discolor*, var. *thyrsoides*. On Wolmer-common.
 — *leucostachys*, Sm. Very common about Selborne.
 var. *vestitus*. Common in shady woods.
 — *carpinifolius*, W. & N. At Oakhanger.
 — *Schleicheri*, W. & N. On Temple-hill.
 — *Koehleri*, var. *fuscus*. Wood below Week-hill Hanger.
 — *rosaceus*, W. & N. In the Lith.
 — *Lejeunii*, W. & N. Between Temple and Wolmer.
 — *rudis*, W. & N. Between Alton and Selborne.
 — *Babingtonii*. In a hedge between Week-hill Hanger and Oakhanger.
 — *cæsius*, L. In hedges about Selborne.

In the following observations I do not deem it needful to *describe* all the species and forms above enumerated, but shall refer to such descriptions in our standard Floras as I have found, on examination, to be most correct, pointing out any particulars in which I have come to a different conclusion, and noticing such prominent characters and habits as have appeared to me peculiarly to characterize certain forms. And, as first on the list, I commence with —

Rubus affinis (W. & N.) Weihe and Nees von Esenbeck, who first described this species, enumerate several varieties, one of which is common in this country; but the specimens which I obtained at Selborne, appear to come very near to what these authors consider the typical form, certainly much more nearly so than any I had previously seen. I have since, in Mr. Babington's collection, seen a very similar plant, which he had obtained at Jardine Hall, in Dumfriesshire, his specimen only differing from mine in being stouter, which was accounted for by its growing in a more exposed situation, — that at Selborne being in a thick shade.

Though this form of the species is rare in this country, one variety, namely, the var. of Weihe and Nees, is an exceedingly common plant, a specimen of which, collected by Mr. Leighton, and authenticated by Nees von Esenbeck himself, I have seen in the collection of Mr. Borrer. It is this which Babington describes under this name in his Manual; while Dr. Lindley's description, in the first edition of his Synopsis, condensed from that of Weihe and Nees, applies both to the variety now spoken of, and to the more normal form mentioned in the above list. In his second edition, Dr. Lindley evidently describes a wrong species under this name: the description is not very explicit, but probably refers to *R. plicatus*, W. et N.

Not to attempt any elaborate settling of synonymes in this notice, I may however add that the variety (γ . *W. & N.*) above spoken of, is evidently the *R. corylifolius* of Borrer, and also of Arrhenius, whose description under this name differs from that of British authors, in describing the barren shoots as smooth instead of hairy. A not very distinct subvariety of this same *R. affinis* γ . (*W. & N.*) is the second form of Leighton's *R. rhamnifolius*, as I have seen by authentic specimens in the herbarium of Mr. Babington. His *R. affinis* and "*R. rhamnifolius*, *second form*," therefore are only slightly varying forms of the same plants.

Presuming that the more common variety may be tolerably familiar, and for a description of which I have referred to the Manual of Babington, I only add that the more normal form, mentioned in the Selborne list, differs from the common English form (γ . *W. et N.*) in the leaves being more flexible, less cuspidate and waved,* and the lower pair not overlapping.

Rubus nitidus (*W. & N.*), would appear, from the very numerous specimens I have seen in different herbaria, labelled with various names, to be both an exceedingly common species, and one very imperfectly understood, or rather very generally misunderstood, being most commonly distributed under *R. suberectus*, *R. plicatus* and *R. rhamnifolius*. The description in the first edition of Lindley's Synopsis is very characteristic; yet it is very remarkable that Professor Lindley himself observes in that edition, that it is only introduced on the authority of Smith. It is yet further remarkable, that though Sir James Smith had certainly seen the plant, as I have been able to verify from Mr. Borrer's collection, his description is evidently drawn up from another species—*R. cordifolius* (*W. & N.*) Notwithstanding its extreme frequency, and that attention was so early directed to it, it yet neither appears in Hooker's Flora, Babington's nor Macreight's Manuals, nor Leighton's Shropshire Flora; and Professor Lindley, who had distinguished it in his first edition, in his second confounds it with *R. plicatus*, under the misnomer of *R. affinis* above mentioned.

As the misunderstanding of this species appears to be so universal, I shall make some rather particular observations on its habits, as well as mention those points by which it may readily be distinguished from the species with which it is apt to be confounded.

* Mr. Babington does not describe the leaves as waved, which however I find invariably to be the case in the variety which he describes, — that with the lower leaves overlapping.

The plant is remarkable for the bright varnished appearance of its angular *stem*, which at first is very generally erect, or very nearly so, and is arrested in its growth quite early in the season. When the light is deficient, here it pauses, and thus remains as a suberect species;* but where it has a full exposure, towards autumn it either makes secondary branches, or the shoot becomes lengthened, and finally roots; but whether rooting or not, it is always suberect in the first instance, and not truly arching, thus holding an intermediate habit between the suberect and arching forms. There are very generally a few scattered hairs on the barren shoots, near the attachment of the leaves. These are long and spreading, but so few as not to take from the polished appearance of the surface. The *prickles* have a broad base, are tapering, straight and deflected. The *leaves* are quinate, remarkably flat, bright green and shining above,† less so but not white beneath, with a pubescence of a few long scattered hairs; the *leaflets* are narrow ovate, pointed, the lower pair small, and always much directed backwards,—not *recurved*, but directed backwards in the plane of the leaf. The *panicle* is compound and leafy; the rachis polished, but with a pubescence of loose scattered hairs, confined to the summit of the panicle. There are generally present some short barren shoots, which are pubescent in the manner described in the observations made above, when speaking on the habits of the genus. In these shoots, and on the panicles, when the leaves become ternate, the backward direction of the larger outer lobes of the lateral leaflets,—answering to the posterior leaflets of the quinate leaves,—is very remarkable. This is excellently represented in the figure of Weihe and Nees.‡

The names under which, in this country, this species has been confounded, are *R. suberectus*, *R. plicatus*, *R. rhamnifolius* and *R. affinis*, from all which it may be distinguished by the compound leafy panicle; from *R. suberectus* (*And.*) and *R. plicatus* (*W. & N.*) by the larger size of the prickles, which are very small, and with a slender base in both these species; and also by the leaflets not being sessile

* Weihe and Nees mention the same variety of habit. They observe, “Species hæc, quæ reliquis suæ cognationis semper exilior, ubi nutrimentum deest, fere erecta crescit.”—*Rubi Germ.* p. 21. As mentioned in the text, I have generally observed a deficiency of light, rather than of nutriment, to determine this difference.

† I borrow this part of the description from that of Mertens and Koch, which agree so accurately with our plant, that there cannot be the shadow of a doubt as to its identity with their *R. nitidus*.—*Deutschland's Flora*, iii. 494.

‡ *Rubi Germanici*, tab. iv.

and overlapping, and by the plant not being always suberect in its growth; still further from *R. suberectus*, by the red fruit of that species, and from *R. plicatus* by the absence of the cuspidate point and the plicate folding of the leaflets, and by the long generally simple peduncles of the leafless panicle — characters so very remarkable in that species. From *R. cordifolius* (*W. & N.*),* by which I understand the *R. rhamnifolius* of Lindley, it is distinguished by that species being arched or prostrate instead of suberect, having large *hooked* prickles, and a long contracted tomentose panicle, in form resembling that of *R. leucostachys*, (*Sm.*) Lastly, it is distinguished from *R. affinis* (*W. & N.*), by the round, arching, or prostrate stem and overlapping leaflets of that species, which also are generally rugose or crisped, or both.

The next species in the list is *Rubus discolor* (*W. & N.*), which, although spoken of as not so common at Selborne, is of all British natives by far the commonest English species. It is hitherto most familiarly recognized in this country as the *R. fruticosus*, this being the name by which it is excellently figured in 'English Botany,' and by which it is described in (I believe) all our British Floras, except the first edition of Lindley's Synopsis. The objections to retaining the name of *fruticosus* to this species, are, that it is perfectly doubtful to what plant Linnæus intended the name to be given; as I am informed by my friend Mr. Borrer, who has examined the authentic

* By *R. cordifolius* (*W. & N.*) mentioned above, I observe that I designate the *R. rhamnifolius* of Lindley. I say of *Lindley*, for really it is difficult or impossible to ascertain what many of our authors intend by this name. One thing at least is very evident, namely, that it has been much confused, and that not only by different individuals applying the name differently, but also in some cases by the same writer evidently including more than one species. It is evident that both Smith and Borrer, if not Babington also, include the subject of the text above — *R. nitidus* — under the name of *R. rhamnifolius*, and that, notwithstanding one of these authors — Sir James Smith — did introduce the name of *nitidus* into his Flora. His description under that name by no means agrees with the plant itself.

That *R. cordifolius* (*W. & N.*) and *R. rhamnifolius* (*W. & N.*), are slightly varying forms of one and the same plant, is an opinion I hold very strongly in common with Mr. Borrer and Mr. Babington, as well as Dr. Lindley. Instead however of taking that one of these two names for the species which these authors have chosen, I have adopted, in my own herbarium, that of *R. cordifolius*, and for the following reasons. As regards antiquity, I believe they both have equal claims, while on the one hand *cordifolius* is a name which is very characteristic of the species, and is not confounded with others, and on the other, *rhamnifolius* is by no means characteristic, and has been confusedly applied to so many forms that it ceases to convey any very definite idea of what may be intended.

Linnæan specimen, that it was made up of portions of several species, one of which is the *R. plicatus* (*W. & N.*), to which, in the very country of Linnæus, concluding it to be the one intended by the great author himself, Arrhenius now applies the name in his excellent Monograph of the Rubi of Sweden. The numbers of other species to which the name has been applied, are beyond enumeration; from this circumstance, and the indefinite and inconclusive manner in which the very author of it applied the name, it ceases to be one of any distinctness or authority whatever.

In applying the name of *R. discolor* (*W. & N.*), by which I now enumerate my Selborne specimens, to the *R. fruticosus* of 'English Botany,' and other British works, I have the concurrence of Mr. Borrer, and also that of Mr. Babington, notwithstanding that the latter gentleman *had* adopted the name of *fruticosus* in his Manual.

With respect to the character and habit of the ordinary forms of this bramble, I need add nothing. The figure in 'English Botany,' and the descriptions in Hooker's and Babington's Floras, under the name of *R. fruticosus*, are abundantly characteristic: and with respect to its habit, I refer to my observations made above. When speaking of the habits of Rubi, I more particularly took this species as the type.

The variety mentioned in the list as var. *thyrsoides* of this species, is distinguished from the ordinary form of *R. discolor*, by the absence of silkiness on the barren shoot, which is less angular, and frequently of very nearly suberect growth, whereby it approaches somewhat to *R. nitidus* in habit, from which, however, it is readily distinguishable by the more simple and leafless panicle, and the absence of the loose hairs — the only hairiness in this being a short slight *tomentum* towards the top of the panicle, which is less prickly, and bearing paler flowers, than in the ordinary *discolor*.

This form is retained as a separate species by Weihe and Nees, being considered by them to be the Linnæan *fruticosus*,* under which name they describe and figure it. We find it, too, retained as a species by Arrhenius, in his Monograph, but not as *fruticosus*, a name which he applies to *R. plicatus*, but under the name of *R. thyrsoides* (*Wimm*). By this latter name I propose to designate it as a variety, it being evidently osculant with the ordinary *R. discolor*. It is how-

* The description in 'English Flora' admits of the idea that Smith may have included this variety under his *fruticosus*.—Eng. Fl. iii. 400. Leighton, in his Shropshire Flora, describes a *fruticosus* as well as *discolor*, which, though evidently a mere variety of the latter, is not the one here spoken of.

ever a very pretty variety, with its shrubby terete and varnished stems, seldom growing so large as the common form.

Rubus leucostachys (Sm.), is one of the commonest species about Selborne, and is certainly one of the best fruited of our brambles. It is now so generally and correctly distinguished from its allies, and the descriptions in our Floras are now so generally characteristic, that it requires few words of notice in this place. It may be well to mention however that there appears little doubt of its being the species figured and described by Weihe and Nees as *R. pubescens*,* the only difference being, that in our British specimens, the leaves are frequently rather more deeply and sharply serrated. In other respects, both the figure and description of these authors admirably agree with our plant, as does also the description of Mertens and Koch,† thus still further identifying our *R. leucostachys* to be the German *R. pubescens*. The vernacular German name given to this bramble, viz., *Weichhaariger Brombeerstrauch* ‡ (weak-haired bramble), is peculiarly appropriate.

But though the typical form of this plant need not detain us long, there is a certain state of it on which I would make some observations. It is a form which I have enumerated in the list as the variety *vestitus* of this species, by which I intend to discriminate a most remarkable form, respecting which there has been much diversity of opinion. The form in question is characterized principally by remarkably round leaflets, an almost suberect growth,§ and a very shaggy clothing of soft white hairs. That this is the form described as *diversifolius* by Lindley, I have had an opportunity of verifying by a specimen in the collection of Mr. Borrer, which he had from Dr. Lindley's own plant in the Horticultural Society's gardens; and that it is the *vestitus* of Weihe and Nees is equally clear, from the circumstance that their figure and description accurately agree with the description of Lindley, and with the specimen from his own plant which I had the above

* *Rubi Germanici*, p. 42, and tab. xvi.

† *Deutschland's Flora*, iii. 499.

‡ *Ibid.*, and *Deutschen Brombeerstrauche von Weihe und Nees*, p. 44.

§ The *almost suberect growth* in this instance may perhaps require some explanation. It is in fact a truly arching form, as described by Lindley, but from the effect of shade—an effect before alluded to, it assumes a higher arch than the exposed form of *leucostachys*. This approach to a suberect growth is totally different from that spoken of under *R. nitidus*, which is first suberect, and only roots afterwards by a distinct secondary growth. In the form now treated of, the arch, though high, is perfectly continuous.

mentioned opportunity of examining. Dr. Lindley's description of this plant is so characteristic, that I feel I have no occasion to describe it, but would only refer to his Synopsis. The point respecting this form of bramble on which I feel myself called upon to speak particularly, is the question as to what is its true position with regard to its affinity or distinctness; and whether it should hold the rank of a variety.

On first observing it myself, which was in the Isle of Wight, in 1843, I not only considered it distinct from any other species I had seen before, but imagined I had discovered something altogether new; and from memoranda accompanying various other specimens of it which I have seen in different herbaria, I find that others—no doubt struck, like myself, by its very remarkable appearance—have had the same impression. It was Mr. Borrer who first suggested to me the opinion that it was the *R. diversifolius* of Lindley, and only a variety of *R. leucostachys*. Dr. Lindley's reply to this opinion is so remarkable, that I may be allowed to quote it. He observes: "Mr. Borrer combines this with *R. leucostachys*, from which it is surely a hundred times more different than *leucostachys* from *fruticosus*, the distinctness of which he admits."* In this opinion I perfectly accord with Dr. Lindley, as far as regards the mere point of difference in external form, and yet, as to specific identity, I am compelled to accord with the opinion of Mr. Borrer.

The form of which we are speaking is essentially dependent on situation, being the result of diminished light; for in the shady wooded districts of Selborne, this variety abounds, and in all the sunny exposures we have the correct or typical *leucostachys*, while every gradation may be seen in intermediate situations. The same fact I have seen times innumerable in the Isle of Wight, and even the specimen in Mr. Borrer's collection, from Dr. Lindley's authentic plant, was already somewhat modified by the change of situation.

With respect to the *Rubus vestitus* of Weihe and Nees, it is not a little remarkable that they should have placed it in the glandulose section of the genus, while the artist—and I have had occasion before to notice the accuracy of the artist, independently of the description of the authors—does not represent a single gland; and even the authors themselves, in describing the number and arrangement of the glands on the panicles, a part of the plant on which they are apt to occur occasionally, even in the species of the other sections, are com-

* Lindley's Synopsis, 2nd edition, p. 94.

pelled to admit them to be "*rare*." A moment's glance at their figure is sufficient to show that it has no affinity whatever with those species amongst which they have arranged it; whereas the form and nature of the prickles, and the nature of the hairiness, at once associate it with their *R. pubescens*.

Concluding therefore that the *R. diversifolius* of Lindley and *R. vestitus* of Weihe and Nees are identical forms, and only a variety of *R. leucostachys*, it remained to choose by which name to designate the variety. I have adopted that of Weihe and Nees, they having noticed it anteriorly to Dr. Lindley; though certainly the epithet of *rotundifolius*, by which I had proposed in my own mind to call the then supposed new species, when the variety first came under my notice, would be a far more characteristic name than either of the above.

I have received two specimens of this variety from the Botanical Society of London; one, collected in Shropshire, under the name of *R. villicaulis*; and the other from Worcestershire, by that of *R. Radula* — *Rubus Radula without a gland or a seta*!

With respect to Mr. Lees' opinion that *R. diversifolius* is a form deducible from *R. cæsius*, inasmuch as he mistakes Lindley's plant, considering it to be one with "abundance of glandulosity,"* whereas the author of the (supposed) species describes it as without glands, — the conclusion of course falls to the ground.

Rubus carpinifolius (W. & N.) is one of the most remarkable and beautiful of our British Rubi; varying considerably according to the situation in which it grows, and seeming to be generally not very well understood: on which account I deem it necessary to give a rather particular description of it.

The mode of growth of the barren shoot is very similar to that described of *R. nitidus* (W. & N.), being at first suberect, in which condition it frequently remains, and also, when it does root, it is by secondary growth after a temporary pause. It is therefore not truly an *arching species*, though ranged with them. The *stem* is angular and hairy, the *hairs* straight and spreading, and very apt to disappear in drying. The *prickles* are very long, straight, and slightly deflected. The *leaves* are quinate; *leaflets* narrow, variously serrated, but the *serratures* very acute and remarkably directed forwards. The *panicle* is variable as to its branching, but narrow and very generally leafless; the *rachis* is hairy, with a few glands occasionally.

The ascending growth, the angular stem with hairs and no glands,

* Transactions of the Botanical Society of Edinburgh, part iii. p. 176.

and the narrow leaflets, with their acute serratures, will generally sufficiently mark this species.

Weihe and Nees, the authors of this species, describe two varieties, one with white flowers and thick leaves, the other with red flowers and more flaccid leaves. The latter is indeed an extremely beautiful plant, with bright shining leaves and brilliant red flowers. It is in this variety that a few glands occasionally occur on the panicle. The two forms are, however, evidently osculant, and our Selborne plant holds this intermediate station.

T. BELL SALTER.

(To be continued).

On the Theory of "Progressive Development," applied in explanation of the Origin and Transmutation of Species. By HEWETT C. WATSON, Esq., F.L.S.

BRITISH botanists, with some few honourable exceptions, would appear to entertain very limited ideas regarding the scope and objects of the science to which their attention is directed. The majority are content to acquire a moderate knowledge of plants and their names, or of the physical characters of parts (shape, proportion, colour &c.) in which their resemblances and differences may be detected. In itself this is doubtless an agreeable kind of study; and it is one, moreover, which so lightly taxes the mind, as to be within the grasp of moderate capacities; for even children can learn Botany thus far. But scarcely any exercise or stimulus is here given to those higher intellectual attributes of man, which are concerned in all trains of reasoning, and which lead to the knowledge of causation and dependance between the phenomena of creation. The study of plants, simply as physical existences, and of their resemblances and differences, on which technical classifications are founded, is an exercise of the same mental faculties which give origin to the restless and prying curiosity of the monkey. So far, the botanist is an intellectual Simia. He advances a step further, when he uses names and terms to express these existences and their similitudes or distinctions. And he ascends successively still higher in the intellectual scale, as the scope of his studies extends over the vital actions of plants—the influence of external agencies upon their growth and health—their relations to the rest of creation—and the mode, or laws, by which the present vegetation of the earth's surface has been substituted in place of a past vegetation, which was greatly dissimilar to that now seen around us.

In this present communication, it is my wish to make some remarks on the last of these subjects. Public attention has been lately directed to that subject, by a volume of considerable merit, published anonymously, under the title of 'Vestiges of the Natural History of Creation.' There is little, very little, of novelty in the book; yet it will probably make the subject more popular, more talked about, and even more thought about, than any previously published work has done. The 'Vestiges' has exactly the character and qualities which are required in a really "popular work." The style is remarkably good and readable—the subject is great and interesting—the illustrations are mostly found in those facts which have been made familiar by public lectures and elementary works—the leading argument of the whole volume, "progressive development," is single, and it is seldom lost sight of by digressions—plausibility is sought, and carried even to case-pleading, rather than any critical balancing of *pros* and *cons*—the reasoning is obvious and direct, leaning more to the superficial than to the profound. Thus, the reader finds himself interested and drawn onward; his mind is neither wearied by dulness, nor exhausted by any serious tax on its powers; he believes that he sees the whole argument or theory clearly made out and established; and he is self-flattered by the supposition of having thus easily acquired a new and important truth.

I allude here, of course, to the "general" reader, who is conversant with the natural sciences to that limited extent which may now be easily attained by attending lectures at a 'Literary and Scientific Institution,' or by the perusal of elementary treatises and other books expressly written for general readers. The judgment of those who have more thoroughly trained themselves in scientific investigation, will not be quite so favourable; although they may pronounce the work to be one of high merit in its class—namely, the class of "popular works." The pretensions to originality, and the success of the argument or evidences, will scarcely be acknowledged by parties who possess a sufficient knowledge of the natural sciences, to render their judgment worthy of much respect. Still, we may allow that the author has embodied an idea, not new in itself, in a more substantial-looking form than it had previously assumed; while he has also given a freshness and fulness to his principle, by tracing its application through many departments of science, and making each yield illustration or evidence in support of the theory.

The author's idea is, that in all departments of Nature—from the origin of a planet or a whole solar system, down to the production of

a plant or animal, or any part of a plant or animal — there are such evident signs and proofs of a gradual and progressive development, that we may believe this to have been an original principle, or a law impressed in the constitution of our universe and of the beings by which it is peopled. He first takes up the condition of the solar system, before the formation of the planets, and traces the change of nebulous matter into the sun and its planetary satellites; all which, of course, is purely hypothetical.

In reading the past history of the earth, as unfolded to us by the researches of geologists, we rest upon grounds that are something more than hypothetical. It may be held a truth, inferred from sufficient premises, that the earth has undergone great changes, in the transition from its past to its present condition. There can be no doubt that the earth was formerly inhabited by plants and animals widely different from those at present existing upon it. It is probable, almost to certainty, that in the earlier condition of the globe, its plants and animals were those of a simpler ("lower") organization, than some of the others which followed them; although always, even to the present times, animals and plants of an equally simple organization existed in abundance, along with those of a more complex ("higher") organization. Such changes were apparently progressive, proceeding generally from the simpler towards the more complex types of structure: invertebrate animals preceding the vertebrate; fishes and reptiles preceding birds and beasts; cryptogamic plants preceding phanerogamic.

A question naturally arises in any thoughtful mind, while contemplating these facts in their stony or earthy records, how plants and animals were first called into being, and by what means the later species were substituted in room of the earlier species? It has been repeatedly suggested, that one or more species may have first emanated from inorganic matter, and that succeeding species may have been formed by mutation or metamorphose of the preceding species. This hypothesis is plausible, to say the least of it. If adopted as a true theory, it would account for much that is at present obscure or incomprehensible. It receives strong analogical support in those metamorphoses which are well known to take place during the progressive development of individual plants and young animals. And there are, moreover, some facts which bear so decidedly on the subject, as to assume almost the character of direct evidence in confirmation of the theory.

On the other side, it must be admitted, when our attention is limited to the plants and animals now existing upon the earth, that much more *primâ facie* evidence is found to countenance a belief in the permanent distinctness of species; and that, consequently, the great majority of naturalists do steadfastly hold to this belief. And we may likewise say confidently, that all the clearest, most readily tested facts, directly tend to confirm the axiom of "*omne ex ovo*."

Against these admissions, it may be fairly contended, that the formation of a plant or animal, from unorganized matter, could only be expected in the case of very small and very simply organized species; and that it is precisely in these cases we find the doctrine of "*omne ex ovo*" to be itself incapable of proof. And as to the metamorphose of one species into another, it must be remembered, that the very definition of "species" comes in the form of a *petitio principii*; since the widest change ever seen, in the descendants of any plant or animal, would only entitle them to the name of "variety," according to recognized usage in the application of these terms.

The author of the *Vestiges* pleads the case of the minority; and I will now quote his views, as briefly as possible, in his own words; strongly recommending his whole volume to the attentive perusal of phytologists.

"The nucleated vesicle, the fundamental form of all organization, we must regard as the meeting-point between the inorganic and the organic — the end of the mineral and beginning of the animal kingdoms, which thence start in different directions, but in perfect parallelism and analogy. We have already seen that this nucleated vesicle is itself a type of mature and independent being in the infusory animalcules, as well as the starting point of the fœtal progress of every higher individual in creation, both animal and vegetable. We have seen that it is a form of being which electric agency will produce — though not perhaps usher into full life — in albumen, one of those compound elements of animal bodies, of which another (urea) has been made by artificial means. Remembering these things, we are drawn on to the supposition, that the first step in the creation of life upon this planet was a *chemico-electric operation, by which simple germinal vesicles were produced*. This is so much, but what are the next steps? Let a common vegetable infusion help us to answer. There, as we have seen, simple forms are produced at first, but afterwards they become more complicated, until at length the life-producing powers of the infusion are exhausted. Are we to presume that, in this case, the simple engender the complicated?" * * *

"I suggest, then, as an hypothesis already countenanced by much that is ascertained, and likely to be further sanctioned by much that remains to be known, that the first [second?] step was *an advance under favour of peculiar conditions, from the simplest forms of being to the next more complicated, and this through the medium of the ordinary process of generation.*"—pp. 204, 205.

"The idea, then, that I form of the progress of organic life upon the globe, is, *that the simplest and most primitive type, under a law to which that of like-production is subordinate, gave birth to the type next above it, that this again produced the next higher, and so on to the very highest*, the stages of advance being in all cases very small—namely, from one species only to another; so that the phenomenon has always been of a simple and modest character."—p. 222.

The author of these passages would seem to be slenderly acquainted with Zoology, and still less conversant with Botany. He has thus written under considerable disadvantages; for it is to these sciences he must turn in search of facts which bear upon the transmutation of one species into another, or the production of one species from another different one. Our concern is with matters botanical; and we cannot compliment the author, on the value of his botanical evidences, which are here copied in his own words.

"It appears that, whenever oats sown at the usual time are kept cropped down during summer and autumn, and allowed to remain over the winter, a thin crop of rye is the harvest presented at the close of the ensuing summer. This experiment has been tried repeatedly, with but one result; invariably the *Secale cereale* is the crop reaped where the *Avena sativa*, a recognized different species, was sown."

* * "Perhaps those curious facts that have been stated with regard to forests of one kind of trees, when burnt down, being succeeded (without planting) by other kinds, may yet be found most explicable, as this is, upon the hypothesis of a progression of species which takes place under certain favouring conditions, now apparently of rare occurrence."—p. 221.

Assuming these to be veritable facts, it may be suggested to the author, that they overprove his theory. The change of the oat into rye, is a pretty wide generic leap. And I am not at all aware that a burnt forest is forthwith succeeded by trees nearest allied, in specific or generic characters, to those which have been destroyed. The phenomena are here scarcely those of "a simple and modest character," or an advance "from one species only to another." Had we been told that the *Avena strigosa* could be so converted into the *Avena*

sativa, or that a burnt forest of *Tilia parvifolia* would be succeeded by another of *Tilia europæa*, the changes would have corresponded better with the theory. In a future communication, I will try whether Botany cannot yield some facts more applicable as tests of this theory. Meantime we may leave it an "open question," which is not to be answered in the negative too hastily. HEWETT C. WATSON.

Thames Ditton, March, 1845

On the proposed Change of Name in Lastræa recurva.

By WILLIAM WILSON, Esq.

WITH all deference to those who propose a change in the name of *Lastræa recurva*, I must say that I see no reason whatever for discarding it: on the contrary, I think it very *apt* and *expressive*, and *in perfect harmony with the use of the term in other cases.*

WILLIAM WILSON.

Orford Mount, near Warrington,
March 17th, 1845.

On the name of Lastræa recurva. By CHARLES C. BABINGTON, Esq.,
M.A., F.L.S., &c.

As in a recent number of the 'Phytologist' Mr. Newman has taken upon himself to express his belief that I am the author of the review of his 'History of British Ferns' in the 'Annals of Natural History,' (Phytol. ii. 26); and as, in the point now to be noticed, I fully agree in the opinion there expressed; I take the liberty of replying to the article by Mr. Bree in the last 'Phytologist,' (Id. 75).

My idea of the *botanical* meaning of the word *recurvus* is derived from the uses to which it is applied by the best botanists. For instance: Smith says "*recurva* or *reflexa*, curved backwards," (Intr. to Bot. 118.). De Candolle, "*Recurvus*, *recurvatus*, *reflexus*, réfléchi, courbé ou fléchi en dehors," (Theor. Elem. 478). Bischoff, "*recurvatus* und *recurvus*, zurückgekrümmt, answärts oder ab wärtsgekrümmt," (Wörterbuch der beschreibenden Botanik, 170). Martyn, "*recurvatum* folium. A recurved leaf. Deorsum flexum, ut arcus superiora spectet. [Linn.] *Delin. Pl.* — Bent, or rather bowed or curved downwards, so that the bow or convexity is upwards," (Language of Botany). Bertolini,—" *recurvata*, deorsum flexa, curva, ut convexitas arcus superiora spectet," (Prælectiones Rei Herbariæ, 274).

I think it will be allowed that sufficient evidence is produced to justify the observations of the reviewer, on the improper use of the term *recurva*, as applied to the plant denominated "Bree's Fern" by Newman. Linnæus, Smith, De Candolle, Bertolini and Bischoff agree in applying the term to a curvature of which the convexity is upwards, not downwards, as is the case in *L. recurva*.

It would undoubtedly afford me much satisfaction to get rid of that name, but I fear it would now be difficult to do so, as it has been twice employed in descriptive works, namely, in the 'Naturalist's Almanack' for 1844, and Newman's Ferns. I have always protested very strongly against this name, and carefully avoided its use when distributing specimens of the plant several years since, as the var. *conca-vum* of *Aspidium dilatatum*. Mr. Newman's observation (Hist. Ferns, 235) that I assured him that I had not proposed the name, is not, therefore, exactly correct. All I stated to him was, that it had not been used by me *in print*, and therefore had no claim to priority over any printed name.

I am quite ready to agree with Mr. Bree that the term *dumetorum* is not much better than *recurva*; still, it is better, since it does not convey an absolutely erroneous impression concerning the form and structure of the plant. It is only as being an older name, even as applied by Mackay to this plant, that I am inclined to employ it, in order to get rid of a term which seems so objectionable. Smith's *A. dumetorum* apparently falls, his specimens being only a diseased or dwarf state of *L. multiflora*.

L. incurva would undoubtedly be a satisfactory name, if it could be generally adopted. Perhaps the readers of the 'Phytologist' will give their opinions as to its adoption. I must confess, however, that my pet name is *concava*, as might perhaps be expected, from my having long made use of it.

C. C. BABINGTON.

St. John's Coll. Cambridge, March 3, 1845.

The word recurvus, as applied in Entomology. By EDWARD NEWMAN.

MR. BREE has, I think, shown us (Phytol. ii. 75) that ornithologists understand the word *recurvus* or *recurved* as implying *turned outwards* and *upwards*, like the bill of the avocet. In this he is perfectly correct: but as every sound argument strengthens a good cause, I may perhaps be allowed to add support from the sister science of Entomology, of which I was once an enamoured student. The fol-

lowing authors apply the word *recurvus* to the points of the antennæ, the margins of the prothorax, the margins of the elytra, or the extremity of the abdomen in insects. Linneus, Fabricius, Gyllenhal, Schönherr, Erichson, Dalman, Burmeister, Kirby, MacLeay, — all so apply it; and there is no instance within my knowledge of any other meaning being intended by these, or by any other entomological writers, than the following, — *curved outwards and upwards, as in the margins of the divisions of the frond in Lastræa recurva*.

But we need not content ourselves with the universal application of the word, although that is strong evidence; let us turn to its meaning as explained in the elaborate work of Kirby and Spence. We find at p. 327 of their fourth volume, — “Recurved (*Recurvæ*), when they curve *upwards*.” No doubt is expressed: no second meaning given. Indeed, it may be stated, that the application of any other meaning to the word *recurvus* than that in which Mr. Bree has used it, would falsify every entomological description in which the word occurs.

Having the universal usage of two sciences in his favour, I trust Mr. Bree will never think of abandoning the name he has proposed for this beautiful fern, the distinguishing of which, at a time when ferns were so little known, does him the greatest credit.

It may be shown that in Botany the word has been used in two senses, but Prof. Lindley, our best botanical orismologist, restricts its meaning to that intended by Mr. Bree.

EDWARD NEWMAN.

Peckham, March, 1845.

On the occurrence of Cnicus oleraceus in Lincolnshire.

By EDWARD EDWARDS, Esq.

HAVING read Dr. Bromfield's communication respecting this thistle, as a British species (Phytol. ii. 53), I beg to mention that I possess a specimen of the plant in question, gathered as wild in Lincolnshire by the late Mr. Cole, of Bourne, about 1823. The plant was then to be observed by the side of the road between Market Deeping and Croyland, a most dreary route among fen levels; but the direct way passed by antiquarian visitors from Deeping, desiring to see the ruins of the once famous abbey at Croyland.

EDWARD EDWARDS.

Bexley Heath, Kent, March 3, 1845.

Correction of an Error in the 'Notes on the Species of Ceanthe.'

By J. S. MILL, Esq.

SINCE my note on the species of *Ceanthe* was printed (Phytol. ii. 48), my specimens from Battersea, Weybridge and Seaford have had the advantage of being examined by Mr. Watson. That gentleman confirms my statement respecting the Battersea and Weybridge plants, which he decides to be his *Ceanthe* Smithii, the *peucedanifolia* of Smith. The plant from Seaford, which I had classed as the *pimpinelloides*, he pronounces to be *Ceanthe* Lachenalii; and he has fully satisfied me, both by his high authority, and by a comparison of specimens with which he has most courteously supplied me, that I was previously unacquainted with the true *Ce. pimpinelloides*.

J. S. MILL.

Kensington, March, 1845.

On the Yellow Juice of Ceanthe crocata. By T. BELL SALTER, M.D., F.L.S.

IN the last number of the 'Phytologist,' my friend Dr. Balfour observes, that in cutting across the root of *Ceanthe crocata*, there is no appearance of a yellow juice; but that after a short exposure to the air, it assumes a yellowish or brownish tint (Phytol. ii. 87). This assertion requires some limitation. As the plant occurs in the Isle of Wight, where it is quite common, the juice can scarcely be said to become yellow at all; while in the specimens which grow about Poole, the juice, not only of the root, but of the whole plant, is of a bright yellow, the moment it is broken or cut. It is darker after exposure, but is of considerable depth of colour the moment it is exposed.

I have little doubt that this variety with the dark juice is the most virulent state of the plant, having a distinct recollection of an accident which occurred to a man at Poole about fifteen years since, in consequence of taking a decoction of it for some skin-disease. Death was produced, certainly within two hours.

T. BELL SALTER.

Ryde, March, 1845.

Notice of the 'Transactions of the Linnean Society of London.'

Vol. xix. part iii.

THIS part contains the following botanical papers:—

'On the Ovulum of Santalum, Osyris, Loranthus and Viscum.' By William Griffiths, Esq., F.L.S.

Any analysis of this elaborate contribution to Embryology would be almost useless in the absence of the numerous illustrations by which it is accompanied.

'On a species of *Carex* allied to *C. saxatilis* (Linn.)' By Francis Boott, M.D., F.L.S.

For the characters of this *Carex*, and its near ally, *C. saxatilis*, we would refer the reader to our first volume (Phytol. i. 910).

'Description of the Female Flower and Fruit of *Rafflesia Arnoldi*, with Remarks on its Affinities; and an Illustration of the Structure of *Hydnora Africana*.' By Robert Brown, Esq., V.P.L.S.

The principal object of this paper is to complete, as far as possible, the author's "history of *Rafflesia Arnoldi*, the male flower of which is described and figured in the 13th volume of the Society's Transactions." In a well-merited tribute to the memory of two eminent men, the author thus speaks of the exceedingly beautiful structural illustrations which accompany this paper. "The figures of *Rafflesia* and *Hydnora*, which so admirably illustrate, and form the more valuable part of this communication, are among the best specimens of the unrivalled talent of the two brothers Francis and Ferdinand Bauer, who, as botanical painters, equally united the minute accuracy of the naturalist with the skill of the artist." The Supplement to this valuable communication contains "the distinguishing characters of the order, tribes, genera and species of *Rafflesiaceæ*."

'On the *Neottia gemmipara* of Smith.' By Charles C. Babington, Esq., M.A., F.L.S., G.S.

We have already given a brief account of Mr. Babington's visit to the locality of this remarkable plant, (Phytol. i. 1003). The following character and description are drawn up by the author from recent specimens.

"*Spiranthes cernua*, Rich.; tuberibus elongato-cylindricis, foliis radicalibus lineari-lanceolatis vaginantibus: exteriori amplexicaule; caulinis triangulari-lanceolatis vaginantibus, bracteis floribus brevioribus, spicâ densâ, floribus trifariis, sepalis petalisque æqualibus obtusis cohærentibus; labello oblongo medio nonnihil constricto apice rotundato crenato.

"*Ophrys cernua*, *L. Sp. Pl.* 1340. *Neottia gemmipara*, *Sm. Eng. Flor.* iv. p. 36. *Spiranthes cernua et Sp. gemmipara*, *Lindl. Gen. et Sp. Orch.* 467."—p. 262.

"Root of two thick fleshy cylindrical blunt tubers, of about an inch long. At the top of the tubers a bud is usually to be found (not a hybernaculum as represented in Eng. Bot. Suppl.), but it is not remark-

able or constant enough to require particular notice. Stalk erect, 5 or 6 inches high, glandular above, bearing two or three smooth triangular-lanceolate attenuated sheathing small adpressed leaves. The radical leaves linear-lanceolate, acute, shorter than the stem, about 4 in number, covering the lower half of the stalk, 2 or 3 inches long; the outermost narrowed considerably below and clasping; the others with a long sheathing base, broadest at the top of the sheath. Spike 1 to 1½ inch long, oblong, dense, erect; of from 20 to 30 rather large milk-white flowers closely placed in three spirally-twisted rows, and each accompanied by a smooth triangular-lanceolate bract, the one or two lowermost of which slightly exceed the length of the flowers, but the rest scarcely equal them. Sepals and two upper petals adhering together and connected through a considerable space from their base in front, their tops free, linear, blunt. Lip spatulate, blunt, crenate; its base very broad, thick, glandular externally, channelled by the inflexion of the sides, and almost inclosing the shortly-stalked column, equalling the sepals. Operculum ovate, acute, dark brown, springing from within the hollowed extremity of the column. Rostellum of the stigma deeply bifid with flattened subulate very acute points, having an elongate linear bluntish dark brown appendage (proscolla) between and extending beyond them. There is a slight blunt projection between the operculum and the rostellum, which seems to represent the intermediate processes which are found in *Spiranthes autumnalis* and *S. æstivalis*." — p. 261.

In speaking of the affinity of this plant, the author remarks:—"In his 'Genera and species of Orchideous Plants,' Dr. Lindley points out the affinity of this plant with the *Sp. Romanzoffiana*, *Cham.* from which it is now found to differ by its much shorter bracts; its blunt, linear and equally broad sepals; and its longer spatulate lip. If, however, we examine another allied species, the *Sp. cernua*, *Rich.* (*Ophrys cernua*, *L.*), we find a plant agreeing most exactly with the Irish *N. gemmipara*; indeed, after a careful examination of Drummond's Rocky Mountain specimens of *Sp. cernua*, I am unable to detect the slightest difference. Smith's name must therefore become a synonym."

The figure which accompanies this paper is from the accurate pencil of Mr. J. D. C. Sowerby; it represents a plant in a more advanced stage than that figured in 'English Botany.'

Notice of 'Species Filicum ; being Descriptions of all Known Ferns. Illustrated with Plates. By SIR WILLIAM JACKSON HOOKER, K.H., LL.D., F.R.A. & L.S., &c. &c. &c., Vice-president of the Linnean Society of London, and Director of the Royal Botanic Garden of Kew.' Parts I. II. and III. London : Pamplin, 45, Frith Street, Soho.

IT has long been our intention to enter on a minute and careful analysis of this important work ; but we have been deterred by several causes. In the *first* place, such an analysis is an undertaking of no ordinary labour : *secondly*, we think it unfair to judge of a great work by a portion in which the author does not seem at home, and which has subjected him to such cutting criticisms from our German contemporaries ; and *thirdly*, we feel that the work was much wanted, and that, if completed, it will supply a desideratum that has long been experienced in botanical literature. Still, though we lay aside the critic's pen, we would, in all good will, recommend the author to pay a little more respect to what has been done in this country and elsewhere, on the subject on which he is writing : he should just skim the contents of other works, and show us that he is at least aware of their existence. Years have elapsed since the writer of this notice attempted to prove that the *Trichomanes brevisetum* of Brown was identical with the *Trichomanes speciosum* of Teneriffe and Madeira : he went thoroughly into the question with his lamented friend, David Don, who agreed in the conclusions drawn : the same view was entertained even by the great botanist who gave to this plant the name of *brevisetum* : the prior name of *speciosum* was therefore restored to the species, and has been subsequently adopted in the publications of Balfour, Ward, Babington and Watson : and yet, Sir William Hooker, at the present day, writes thus : — " Yet even Sir Jas. Smith did not suspect that it was a plant already, though imperfectly, described, of South America, and even of Teneriffe and Madeira ; nor has any one ventured to publish it as the same to the present day."—p. 126. We think Sir W. Hooker ought to have known that all British botanists are perfectly aware of the identity of the Irish and Madeira plants ; for had he examined any herbarium but his own, he would have found the name of *speciosum* restored, and thus he would have saved himself from very grave charges which are now made against him for want of candour, in instances which in charity we refer to a want of care.

Again, in describing the species of *Trichomanes* and *Hymenophyl-*

lum, Sir William takes no notice whatever of Presl's masterly work, but redescribes that author's species as new, and gives them new names: but when his attention is called to Presl's Monograph, we find a summary of its contents given in the 'Synopsis Filicum,' as a kind of episode to the previous descriptions.

Many other instances could easily be pointed out in which similar objections could be raised; but we trust that Sir William Hooker will yet endeavour to make his work deserving of that patronage which all botanists are anxious to give it, on the faith of the author's reputation. No man living possesses such opportunities of making a perfect work on the Species of Ferns, as Sir Wm. Hooker. His habitual use of the pen; his own matchless herbarium; the living collection at Kew, brought to such perfection by Mr. Smith; and the assistance of that great pteridologist — that walking Encyclopedia of Fern Science, ever at hand to solve all questions of doubt and difficulty: — such a combination of favourable circumstances tend to place our author in a situation rarely if ever enjoyed by a botanical monographer. And sincerely do we trust that the work, when complete, may be alike honorable to its author and profitable to the spirited publisher, who, we hear, has undertaken it at his own cost and risk, a fact which, considered in reference to the notorious want of patronage for scientific works, does him, in our estimation, infinite credit.

We must not conclude this brief notice without expressing our admiration of the excellently drawn plates, twenty in each part, and each containing figures of several species.

Notice of the 'London Journal of Botany.' No. 38, February, and No. 39, March, 1845.

These numbers contain the following papers on exotic Botany:—

'Decades of Fungi,' by the Rev. M. J. Berkeley, M.A., F.L.S.

'Description of a New Genus of Papaveraceæ, detected by the late Dr. Coulter in California,' by W. H. Harvey, M.D., M.R.S.A.

'Characters of two New Genera of Cruciferæ, discovered by the late Dr. Coulter in California,' by W. H. Harvey, M.D., M.R.S.A.

'Hepaticæ Antarcticæ, Supplementum, or Specific Characters with brief descriptions of some additional species of the Hepaticæ of the Antarctic Regions, New Zealand and Tasmania, together with a few from the Atlantic Islands and New Holland,' by J. D. Hooker, M.D.R.N., and Thos. Taylor, M.D.

'Contributions towards a Flora of Brazil, being the distinctive characters of a Century of New Species of Plants from the Organ Mountains,' by George Gardner, Esq., F.L.S., Superintendant of the Royal Botanic Gardens, Ceylon.

'Contributions towards a Flora of Brazil, being the distinctive Characters of a Century of New Species of Plants from the Organ Mountains,' by George Gardner, Esq., F.L.S., Superintendant of the Royal Botanic Gardens, Ceylon.

'A Brief Description of a New Species of Mammillaria in the Royal Botanic Gardens at Kew,' by Frederick Scheer, Esq.

'On the Huon Pine, and on Microcachrys, a New Genus of Coniferae from Tasmanica; together with Remarks on the Geographical Distribution of that Order in the Southern Hemisphere,' by Joseph Dalton Hooker, M.D.R.N., Botanist to the Antarctic Expedition.

'Observations on a New Genus of Ferns,' by J. Smith.

Notice of the Annals and Magazine of Natural History, No. 97.
March, 1845.

THE only original botanical paper in this number is the continuation of Mr. Ralfs' descriptions of those debateable beings, the Desmidiæ. In a former number we mentioned that the spores of this obscure tribe had recently been described as animals: by a singular coincidence, Professor Rymer Jones's 'Natural History of Animals' is published at the same time with this number of the 'Annals,' and these two works come to our hands together. Each contains figures of Staurastrum; Mr. Ralfs treating them as vegetables, Mr. Jones as animals. Botanists appear, for the most part, to side with Mr. Ralfs, zoologists with Mr. Jones: surely we may be allowed to doubt.

"Grammatici certant: adhuc sub judice lis est."

Some of Mr. Ralfs' observations on the mode of reproduction in Staurastrum are highly interesting.

"During the past summer I several times observed, scattered amongst various Desmidiæ, orbicular spinous bodies, the colouring matter of which formed a dense green mass, which tested by iodine assumed a dark blue colour, showing its vegetable nature. On careful examination I found that each of these bodies was usually accompanied by two empty fronds of Staurastrum mucronatum, and was placed between them, though not in actual contact. Still it appeared so unlike any sporangium I was acquainted with, that I arrived at the

conviction that it was the reproductive organ of the *Staurostrum*, only after repeated observations and tracing the formation from the commencement.

"I then transmitted specimens to Mr. Jenner. He also at first doubted the connexion between the fronds and the spinous body, but after a minute inspection he confirms my observations in the following words: 'I think I can *say positively* that I have traced them from the first conjugation to the full-formed spinous body, and I now feel satisfied that they are the spores or sporangia of the *Staurostrum*.'

"The difficulty in detecting the connexion between the empty fronds of the *Staurostrum* and the sporangium depends upon the tenuity of the connecting membrane; the fronds also are generally at a considerable distance, and soon become detached.

"In the conjugated specimens the fronds are always smaller than usual; I have already noticed a similar fact respecting *Tetmemorus granulatus*.

"In *Staurostrum mucronatum* the conjugated fronds are at first closely connected by the formation of a bag-like receptacle which is colourless and very thin, and therefore difficult of detection. As this enlarges the fronds become more remote from each other, their segments partially separate at the constriction on the inner side, the endochrome of both passes out, unites and forms an orbicular body between them. In this state it resembles the sporangium formed in some species of *Closterium*. At first it is inclosed in an orbicular membrane larger than itself, but as it increases in size and density, fine hairs make their appearance on the surface and gradually become stout spines, the membrane lastly disappears and the sporangium acquires its perfect state, covered with conspicuous acute spines.

"In this stage the empty fronds of the *Staurostrum* seem scarcely connected with the sporangium; except that they are on opposite sides of it, have an opening towards it, accompany it in its movements, and always retain the same relative position.

"The fronds of the *Staurostrum* in an end view had sometimes three and sometimes four rays; in conjugating a four-rayed variety would often unite with one having three rays, and occasionally a frond might be seen having four rays on one segment and three on the other. These facts are another proof that the number of rays on a segment cannot constitute a generic distinction in these plants.

"It is probable that, under favourable circumstances, conjugation takes place in all the *Desmidiæ*. It is not uncommon in various species of *Closterium*; I have seen it in this genus and in *Tetmemo-*

rus, and Meneghini mentions its occurrence in *Desmidium*. That the sporangia are not more frequently detected may be partly owing to their minuteness, but I believe that once formed they descend to the bottom of the pool and become mixed with the mud. It is well known that in the *Conjugatæ*, when all the sporangia are formed, the plant sinks to the bottom; and I may remark in support of the opinion I have advanced, that in a small pool at Dolgelley after a shower I could not obtain a single specimen of the *Staurostrum* in a conjugated state, although the day before the sporangia were abundant. In a few days the *Staurostrum* was again plentiful, but I no longer met with any conjugated specimens, although I frequently sought for them."—p. 153.

Notice of 'A Botanical Guide to the Environs of Cheltenham; comprehending a Classified Arrangement of the Indigenous Flowers and Ferns of the Cotteswold Hills and the Vale of Gloucester; with the Habitats of the various Plants. By JAMES BUCKMAN, F.G.S., Corresponding Member and Local Secretary of the Botanical Society of London, Honorary Secretary of the Cheltenham Literary and Philosophical Institution, &c. &c.' Cheltenham: H. Davies, Montpellier Library; and D. Bogue, London. 1844.

THE object of this little work is sufficiently indicated by its title, which we have given at full length. The author has evidently taken pains to render it a *complete* list of the floral productions of the district, of about ten square miles in extent; and, as a guide to the various localities of the plants, we should suppose it will prove useful to botanical students visiting Cheltenham: and the more so, as we learn from the Preface that this "is the first attempt which has been made to tabulate the plants of an undoubtedly interesting locality." The botanical portion is introduced by a brief account of the geographical and geological features of the district.

As we are nothing if not critical, we may just say that a little more care might advantageously have been bestowed in the correction of the spelling of the botanical names, many of which now look anything but botanical.

Notice of Contributions towards a Fauna and Flora of the County of Cork, read at the Meeting of the British Association held at Cork in the Year 1843. The Vertebrata by DR. HARVEY. The Mollusca, Crustacea and Echinodermata by J. D. HUMPHREYS. The Flora by DR. POWER. London : John Van Voorst. Cork : George Purcell & Co., 20, Patrick Street. 1845.

Under the above title are comprised three separate and distinct local catalogues ; the third — the only one which requires any notice from us — is headed, ‘ The Botanist’s Guide to the County of Cork,’ and contains a list of the native plants of the county, with their stations. In the arrangement, the Natural System is followed, and the nomenclature is that of Babington’s Manual. The number of phænogamous plants ascertained to grow in the county is 885 ; of cryptogamous plants, 935 ; total number of species, 1820.

In his Preface, the compiler gives a concise summary of the works in which the Botany of this county have been illustrated. “ Dr. C. Smith in his History of Cork in 1750 ; Dr. W. Wade in his *Plantæ Rariores Hiberniæ*, 1804 ; and Mr. J. T. Mackay in 1806, noticed a few of the rarer native plants of the county of Cork ; but there was no attempt at a systematic catalogue of our Flora till 1819-20, when Mr. James Drummond, Curator of the then existing Cork Botanic Garden, and now Colonial Botanist at Swan River, published a list of our Flowering Plants in the Munster Farmer’s Magazine. Dr. Scott, of Cove, gave a comprehensive catalogue of the native plants of the Great Island in 1833 ; and our townsman, Mr. H. T. Alexander, now Surgeon in the Royal Navy, presented to the Cuvierian Society of this city, a list embracing the entire Flora of the County (the Fungi excepted), for which an honorary prize was awarded by the Society.”

“ These catalogues, a collection of manuscript botanical notes by the Rev. Dr. Hincks, which he has kindly permitted me the use of, and the records of the Cuvierian Society, together with my own extensive practical observations, have constituted the chief materials for these pages.” The compiler also expresses his obligations to various botanical friends for their communications, each individual’s contributions being acknowledged under the particular species.

The catalogue appears to have been compiled with great care, and the notices attached to many of the species are interesting.

Proceedings of Societies.

BOTANICAL SOCIETY OF EDINBURGH.

February 13, 1845.—Dr. Douglas MacLagan, President, in the chair.

Dr. Herman Hoffmann, Giessen, was elected a foreign member of the Society.

Various donations to the library and museum were announced, and the following communications were read : —

1. Dr. Sella read a paper, entitled, "Examination of the views adopted by Liebig on the Nutrition of Plants." He contrasted Liebig's view of the mineral nature of the food of plants, with that which represents their food as organic. He traced out the consequences deducible from this last hypothesis, as affecting not merely the vegetable, but the animal kingdom also; the latter being ultimately sustained solely by vegetable substances. He showed that, whereas the view adopted by Liebig nowise restricts the duration of the organized kingdoms, as long as they remain exempt from the influence of destructive agencies from without, the opposite view involves the conclusion, that the whole of organic nature is hastening rapidly to dissolution from inherent causes, and he affirmed, that were certain data somewhat more carefully considered, the period of the final extinction of plants and animals, in accordance with this hypothesis, might be pretty nearly determined. He regarded this question as one not merely of high interest in itself, but as bearing expressly on the solution of the problem, whether the food of plants be organic or mineral.

Dr. S. calculates the annual conversion of the carbon of organic matter into inorganic carbonic acid, at not less than six hundred millions of tons; and infers, on the most favourable aspect of the amount of soil over the earth's surface, that such an annual loss could not be withstood beyond six thousand years; and, on a less exaggerated assumption of its amount, probably very near the truth, that the waste would absorb the whole of the existing organic matter of the soil in about seven hundred and forty years.

Dr. S. contends that the truth of these conclusions remains unaltered, even if it be conceded that much of the carbon of plants is drawn, not from the organic matter of the soil, but from the inorganic carbonic acid of the atmosphere, unless some inorganic source of their hydrogen and oxygen be at the same time admitted. He, therefore, regards Liebig's view of the inorganic nature of the food of plants as supported, not merely by many special facts — for example, by the increase of the organic matter of the soil, often observed during the growth of plants,—but also by the general view of the earth's surface

just taken, because there is nothing in its aspect to warrant the idea that its means of maintaining the organic kingdoms are declining with the rapidity indicated in the statements just made.

Dr. Sella next examined Liebig's views of ammonia: — 1. As the sole source of the nitrogen of plants, and thereby of animals. 2. As having its exclusive origin from the interior of the earth, and never from the nitrogen of the atmosphere. In regard to these statements he made it appear, as there is no evidence of ammonia being thrown forth from the bowels of the earth at all times, in quantity proportioned to the waste of it necessarily sustained at the surface by decomposition, as into uncombined hydrogen and nitrogen, that Liebig's view of ammonia infers the same limitation of the existence of the organic kingdoms to a few thousand years, as is deduced from the hypothesis of organic matter being the food of plants. Here, therefore, he dissented from Liebig, contending that ammonia must be produced from the nitrogen of the atmosphere, and showing the probability of what is taught by Professor Johnson, namely, that the nitrogen of nitrates, formed from the atmosphere, is fixed by plants, as well as the nitrogen of ammonia.

In conclusion, he reviewed the evidence of potassa, the phosphates and other saline matters, of both organic kingdoms, being derived originally from the crumbling of rocks; and dwelt on the retardation of vegetable physiology, by the long scepticism of botanists on this head, owing, as he believed, to their distrust in the conclusions of chemistry: and went on to show that chemistry must be the groundwork of vegetable physiology in its present stage, and that the frequent changes in the aspect and nomenclature of chemistry, did not materially affect the facts which it daily affords for the elucidation of vegetable economy.

2. A paper by Mr. Ralfs, Penzance, on the genus *Closterium*.

3. Mr. M'Nab read a continuation of his Journal of a Tour through part of the United States and the Canadas. The last portion read before the Society gave an account of the journey from Montreal to Kingston, and concluded with an account of a botanical excursion to the eastward of the latter place.

The woods to the westward of Kingston appeared very dense, chiefly consisting of stately beeches, growing in rich vegetable soil. Several very remarkable plants were observed, and among others the *Monotropa uniflora* and *M. Hypopitys*: the former, which is abundant in shady beech-woods throughout the country, and always growing from amongst leaves, is known to the inhabitants by the name of

Indian pipe, or bird's nest; the latter is not so plentiful, but found in similar situations. Here also *Corallorhiza multiflora* and *Orobanche Virginica* were found, and at one place, in a dense thicket, the rare and curious *Pterospora Andromeda*.

Near the confines of the woods, in drier situations, the white and pink varieties of *Phryma leptostachya* occurred; and on the dry limestone ridges, which prevail in this neighbourhood, large quantities of *Triosteum perfoliatum*, *Gnaphalium margaritaceum* and *Botrychium obliquum* were found; along the margin of Lake Ontario, *Serpicola verticillata* was noticed, its delicate flowers floating on the surface. The beech, sugar-maple and white pine, from their quantity and local situation seem to have been the original inhabitants of this district; and mixed with them, but not so much in groups, were noble specimens of oaks, elms and walnuts. The sugar-maples bore evident marks of having been often pierced for their juices. Fringing the edges of some meadow land in this district, the stag's-horn sumach (*Rhus elegans*) presented a most magnificent appearance from the quantity of scarlet fruit which they carried.

He was agreeably surprised to see such a variety of native hawthorns, being convinced of their fitness for forming hedges so very much wanted in this country, and which many of the inhabitants expressed a great desire to have, instead of the unsightly snake fences which at present separate the fields. But apparently they never thought that the indigenous thorns would answer for this purpose, as they talked of importing haws and whitethorns from Britain. Mr. M'Nab gave instructions to those individuals with whom he had an opportunity of conversing upon the subject, so that they might raise thorns for themselves, as an abundant supply of seeds may be annually procured at no great distance from each settlement. As these instructions may be interesting to others, we here repeat them.

"The fruit should be gathered about the end of October, care being taken to keep the seeds of the luxuriant growing sorts from those of the dwarfer kinds. A pit should be prepared about a foot and a half deep, into which the fruit is to be put, with a mixture of earth or sand. It should be turned several times during the season, and if dry, a little water may be added. One or two inches of soil being a sufficient covering to ensure the decomposition of the pulp. During the following October a piece of good ground should be prepared, and the seed sown as it is taken from the pit, pretty thick, in drills about a foot distant from each other, or in beds three feet wide. In the succeeding spring the plants will begin to appear; at which time, and

throughout the season, they must be kept clear of weeds. If properly attended to, the seedlings will attain a height of from six to twelve inches the first year. The following spring the strongest plants may be either transplanted into drills, or placed where they are intended to remain as a permanent fence. The smaller ones should be left in the seed-drills or beds for another year, when they may be treated in the same manner. In forming a live fence, the ground ought to be prepared as soon as the snow disappears, by making a trench about two feet broad and a spade in depth. Along the centre of this trench, the young plants should be put about six or eight inches apart, and afterwards well watered and firmly trodden in. Care should be taken to protect the young plants from cattle, and clear off the weeds.

"The second year after planting, the thorns should be headed down to within six or ten inches of the ground, and each year afterwards switched up on both sides to a centre ridge, so as to produce the shape generally termed sow-backed. Hedges trained in this form being less liable to be destroyed by snow resting upon them, than when cut flat at the top."

If the method here recommended be properly attended to, Mr. M'Nab has not the least hesitation in saying that an excellent hedge of native thorns may be acquired five or six years after planting. At several places he saw the indigenous thorns employed as a fence; at least they had been planted with that intention, and had attained a considerable height; but from want of proper attention to pruning and weeding, they were so slender that easy access might be obtained between each stem. From such instances of mismanagement, an erroneous opinion seems generally to prevail, that hedges will not succeed in America. "But," as Mr. M'Nab very properly remarks, "if newly planted hedges in Britain were equally neglected, there can be no doubt that they would soon degenerate, and become no better than those which I observed in the United States and Canadas." — *Wm. W. Evans.*

BOTANICAL SOCIETY OF LONDON.

March 7, 1845.—Edward Doubleday, Esq., F.L.S., Vice-president, in the chair.

Various donations to the library and herbarium were announced.

Read, a paper from G. H. K. Thwaites, Esq., being a "List of Grasses found in the neighbourhood of Bristol, (within a distance of six miles in every direction from a common centre)." — *G. E. D.*

Memoranda on Equisetum variegatum, E. Wilsoni, and some other Plants observed in Ireland. By DAVID MOORE, Esq.

THE opportunity which two more years have afforded of observing *Equisetum variegatum* from Portmarnock, and *E. Wilsoni* from the Royal Canal, near Dublin, has greatly tended to strengthen my original opinion of those two plants being perfectly distinct species; although it is difficult to apply in words characters sufficiently pointed to distinguish them. Under cultivation they remain *unalterable*, and present nearly the same forms as they do in their natural habitats. The canal plant, after being cultivated *four* years in the garden, retains its *stout upright* habit, and the Portmarnock plant, under the same circumstances, its *slender decumbent* habit, being only *one half* the size of the former in *every way*. Besides, the periods of flowering are different; the canal plant is now (April 17th) in full bloom, which is most profusely produced, there being scarcely a stem but what is terminated by a catkin: and even in this instance they differ, *our E. variegatum* producing flowering stems comparatively *sparingly*, whether in a cultivated or natural state, and not flowering *generally* earlier than June, though catkins in some state may be observed on it, as well as upon all the other species of British unbranched *Equiseta*, during the whole year.

Mr. Mackay has had the two plants under cultivation for some time, and considers them distinct; and Mr. Ogilby, who observes them very closely, and at all seasons, both in the garden and where they grow naturally, is of the same opinion, as well as Mr. Johnstone; the former of whom tells me, the canal plant appears very conspicuous at present, among the few things yet in flower. ♣

Teucrium Scordium. In the course of a hasty run, last June, to Portumna-bridge, for the purpose of searching for *Teucrium Scordium* and other plants, I found the *Teucrium* in great abundance, where Mr. Mackay observed it nearly forty years ago, and was able to trace it for several miles along the Shannon, both above and below the bridge. Mr. Babington, in his Manual, has stated that the Portumna specimen in Smith's herbarium "has the leaves more suddenly attenuated below and the whole plant more glabrous than his foreign specimens," which I should say results from situation, as I observed the specimens, in different localities, to vary considerably, although *no doubt the same species*. When growing in deep water, the plant is almost quite *glabrous*, except a few long hairs about the stem, and the leaves are *cordate-amplexicaul*, obtusely crenate and *bluntly* oblong.

When on dry ground or in shallow water, but especially when growing among the loose stones, where it is only covered with water during winter, or by occasional floods, the whole plant is *very hairy*, with the leaves *remarkably attenuated* at the base, almost stalked.

Chara latifolia occurred sparingly about a quarter of a mile below Portumna-bridge; thus affording a second habitat for that very distinct species. It may, however, be well to mention, that the Shannon affords an outlet to Sadiston-lake, where I first found the plant.

Lastrea Thelypteris was also observed in a boggy wood in the Marquis of Clanricarde's demesne, much finer than I ever saw it elsewhere. Some of the fronds being eighteen inches long, and well developed every way.

Sesleria cœrulea, which has hitherto been considered a scarce grass in Ireland, forms the principal portion of the pasture in some parts of the Marquis of Clanricarde's demesne, growing to the verge of the Shannon. Mr. M'Nab of Edinburgh, and a party of Scotch botanists, who visited Ireland a few years ago, found the *Sesleria* in a similar situation in the Co. Galway, where it appeared to that experienced and acute observer, a different-looking plant from that he had been in the habit of seeing on the Scottish mountains, as he pointed out to me last season, showing that the Irish plant is much more slender than the Scotch one, with longer leaves and longer culms, characters which do not alter from cultivation. They are certainly very distinct varieties, if not species.

Spiræa Filipendula. A solitary specimen was found in the Marquis of Clanricarde's park, which is chiefly interesting on account of its being an addition to the Irish Flora. I had however received the roots in very considerable abundance last spring, from the neighbourhood of Gret, Co. Galway, where it must grow abundantly, scarcely a sod of *Gentiana verna*, which it came with, being without roots of the *Spiræa*.

Several other plants, which do not occur generally, were observed on this occasion; and I have no doubt that any botanist who locates himself a few days at Portumna, during the month of July, will be able to employ his time profitably.

D. MOORE.

Glasnevin, Dublin, April 17, 1845.

Observations on the Genus Rubus ; with a Notice of the Species observed during three days at Selborne. By T. BELL SALTER, M.D., F.L.S.

(Concluded from p. 108).

RUBUS Schleicheri (W. & N.) should have been marked in the list with a point of doubt; for although it is certainly the plant so named by Leighton, on the authority of Nees von Esenbeck himself, — as I have tested by comparing specimens together,—yet I cannot feel perfectly satisfied of its being the same that is represented by this name in the ‘*Rubi Germanici*.’ The first short description in that work agrees very tolerably both with Mr. Leighton’s plant and that of Selborne, which is decidedly the same form as his, but neither the more lengthened description of those authors, nor their figure,* agree entirely with the English specimens. Yet Nees named Leighton’s specimen very confidently, and adds that it is a good species.†

There being no description of this plant in any of our general Floras, I copy the following excellent one from Leighton’s admirable local Flora.

“*Stem* arched” or “prostrate,” obsoletely angular, nearly “round, with scattered hairs and glandular bristles; *prickles* scattered, very unequal, diminishing insensibly into setæ, straight and horizontal or slightly recurved; *leaves* quinato-pedate or ternate, lateral leaflets often two-lobed, obovato-acuminate, central leaflet roundish, narrower and subcordate at the base, acuminate, hairy above, green, soft and pubescent beneath; *panicle* compound, upper branches single-flowered, very hairy, glandular, setose and prickly; *floral leaves* ternate, central leaflet obovato-acuminate, upper ones simple; *calyx* reflexed in flower, erect and clasping the fruit, hoary, hairy, glandular and setose; *fruit* nearly globular, grains large, black.”‡

To this description I only add that the barren shoot is slightly glaucous, and that the prickles of the panicle are numerous, long, straight and deflected.

The nearest affinity appears to be with *R. Koehleri* (W. & N.), between which and *R. cæsius* (L.) this holds a middle rank. Babington accounts it to be a variety of *R. dumetorum* (W. & N.), but I much more incline to the belief of its being a variety of *R. Koehleri*, which, in the character of the panicle, it very strongly resembles. Our Eng-

* *Rubi Germanici*, p. 68, tab. xxiii.

† Leighton’s Shropshire Flora, p. 237. ‡ Ibid.

lish plants, whether specifically distinct or not from that from which Weihe and Nees' figure was taken, have the barren shoot very much less armed.

Of that variable, very striking, and not otherwise than handsome species, *R. Koehleri* (*W. & N.*), the only specimens I found at Selborne were of the form which I have given in the above list as the var. *fuscus* of this species. No variety or so-called species has yet been given by this name, in former enumerations or descriptions of British Rubi, but as I designate by it a form which has been long recognized and described in our Floras, it is needful that I should make some explanation on this matter.

Many nearly allied forms, — of which the present is one, — were named and described as species in the 'Rubi Germanici,' all of which, succeeding observers have agreed, *cannot*, as species, be kept distinct, and of these numerous forms, all have agreed in taking *R. Koehleri* as the type, — though all have not agreed as to how many of the recognized forms, which hold affinity with it, should be united to it as varieties, or still be held distinct as species.

One of the forms above mentioned is that found at Selborne, which has led to these observations, and is that given by Leighton, in his Shropshire Flora, as the *R. fusco-ater* of Weihe and Nees, and very distinctly distinguished as a variety of *Koehleri* by the same name in Babington's Manual, and in the new edition of 'English Botany,' — the authors of all these works supposing it to be the plant distinguished as the species *R. fusco-ater* by Weihe and Nees. That it is not their *fusco-ater*, I think I shall be able satisfactorily to prove. As regards the opinion contained in the above British works, that this form is not specifically distinct from *Koehleri*, I most fully agree with them. I am disposed to range as varieties of that species all the forms which Weihe and Nees give as species, under the names of *R. apiculatus* — a form found at Beeston Castle by Mr. Borrer, in 1843; *R. fuscus* — that now under consideration; and *R. infestus* — to which I have referred some specimens marked *Koehleri* in some herbaria, but where the specimens had been collected I do not recollect. It is a matter of doubt, too, whether I would not refer the last form spoken of as *R. Schleicheri* to *Koehleri* as a variety. Of all the forms these authors have grouped together as species allied to *Koehleri*, *their R. fusco-ater* — not that of Babington, which I consider to be their *fuscus* — is the only one, I feel convinced, that should be kept distinct. The overlapping leaflets of the real *fusco-ater* (*W. & N.*), well represented in the

figure* in *Rubi Germanici*, the cuspidate and crisped leaflets, the less angled stems and the absence of remarkably long prickles in the panicle, and, I may add, a decided and obvious difference in the general appearance and habit of the plant, which I have found frequently about Poole in Dorsetshire, quite distinguish it both from the Selborne plant, and all the other forms of *R. Koehleri*.

Whether Lindley intended by *R. fusco-ater* the plant of Weihe and Nees, or Babington's variety of this name, I do not certainly know, though I have reason to believe he intended the latter. This, I know, by reference to his herbarium, is not the Poole plant above spoken of, and which I believe there can be no doubt is identically the same, which the authors of the species intended by *fusco-ater*, but that it is the plant given as var. *fuscus* in my list, and to which variety I have given this name, because it appears equally evident, both that it is the plant which Weihe and Nees intended by their *R. fuscus*,† and that it cannot properly be held as truly and specifically distinct from *R. Koehleri*. It is to be readily distinguished from the true *fusco-ater* by the narrowness and distinctness of the leaflets, from the normal *Koehleri*, by the absence of the *long* straight prickles in the panicle, and lastly, from the var. *apiculata*, to which it most nearly approaches, by the cuspidate leaflets and larger serratures.

R. rosaceus (W. & N.) is the next name on our list. Though no *Rubus* by this name has appeared in our British books, yet I cannot altogether assert that it is new to our Flora, it being, as I have ascertained by comparison, identical with the Channel Island plant given by Mr. Babington in his Manual as *R. Lejeunii*. As however, his — the only British — description, does not appear quite to characterize the plant distinctly, I add the following modification of it.

Stem slender, arched and rooting, angular, hairy, setose, abounding with glands; *prickles* numerous, slender, straight, deflected, very unequal and passing insensibly into setæ. *Leaves* ternate, or occasionally quinato-pedate; *leaflets* stalked, obovate or obovato-lanceolate, acuminate, hairy above, rather downy beneath, coarsely and unequally serrated. *Panicle* with long straight prickles, decompound, with two principal branches below, and tapering above. *Calyx* long, with a foliaceous point, reflected in fruit. *Rachis*, *peduncles* and *bracteas* densely covered with red glands.

This is, indeed, a most truly beautiful plant; the petals are long,

* *Rubi Germanici*, tab. xxvi.

† Ibid. p. 73, tab. xxvii.

and of a beautiful, delicately shaded and rather pale pink, and the whole shrub of a slender and elegant growth; while the numerous red glands which cover and even tint the panicle, give it almost a mossy appearance, very like that of some of the roses. It is not, however, I apprehend, on this account, that the name of *rosaceus* has been given to the species, but on account of the foliaceous extremities of the calyx, which, when the plant is in bud, give it a somewhat urceolate appearance, as in the roses; the glands on the calyx, however, add much to the effect. In the figure of Weihe and Nees* this appearance is either somewhat exaggerated, or, what is more likely, the degree of the foliaceous extremity varies, a circumstance not uncommon with foliaceous appendages in general. In the Selborne specimen, as well as that of the Channel Islands, the foliaceous portion is little more than rudimentary, still, both as regards the figure and the description,†—which latter agrees excellently with our plants,—there is amply sufficient to identify them with that of the *Rubi Germanici*. As regards the figure in that work, it is taken at the time which most favours the rose-like appearance of the plant, namely, when in bud, but as none of the other species are figured in this state, it is objectionable, as it deprives those who consult the work, of the opportunity of comparing the representations under equal circumstances.

In the herbarium of Mr. Borrer, is a specimen of this species, and one which perfectly coincides in every character with my own and Mr. Babington's, which was gathered by Mr. Woods near Verviers, in company with M. Lejeune, and by him authenticated. This is satisfactory, not only as confirming on high authority the opinion of our British specimens' being *R. rosaceus*, but more particularly so as disproving them to be *R. Lejeunii* according to the first opinion of Mr. Babington, as it is not likely that Mr. Lejeune would be unacquainted with the species named after himself, and the more particularly so, as the circumstance of his having had to correct an error‡ respecting it, must have the more impressed it upon his mind. Mr. Lejeune also,

* *Rubi Germanici*, tab. xxxvi.

† *Ibid.* p. 85.

‡ Weihe and Nees (*Rubi Germ.* p. 79), and Mertens and Koch (*Deutsch. Fl.* iii. p. 505), are in error in referring *R. Lejeunii* (*W. & N.*) to the *fruticosus* of Lejeune in the '*Flore de Spa*,' p. 233, (not 133, as they give it); his *fruticosus* there mentioned being the *R. discolor* of Weihe and Nees. This mistake arises from an error of Lejeune, in his '*Revue de la Flore*,' at p. 100, where he himself makes the mistake which those authors have copied, but which he afterwards corrects and fully explains in the '*Additions et Corrections*' at pp. 240-41.

in his 'Flore de Spa,' recognizes *R. rosaceus* to be a plant of his own neighbourhood.*

It is not a little remarkable that in displacing *R. Lejeunii* from our Flora, I am immediately able to restore it, having found it within two miles of the station of *R. rosaceus*, both being in the parish of Selborne. We leave further remarks on this bramble till we come to speak of it in its proper place — except that being one of the allies of the one which now occupies us, it may be well to state the characters by which they may be distinguished. *R. rosaceus* may be known from *R. Lejeunii*, by the far greater abundance of glands in every part, by the leaves being ternate instead of quinato-pedate, by the absence of tomentum from the panicle, and by the greater length of the calyx.

The only other species with which it appears needful to draw a distinctive comparison, is that one, which of all the genus bears the strongest affinity with *R. rosaceus*, namely, *R. Bellardi* (*W. & N.*), — which has recently been added to our Flora by Mr. Richard Spruce, who discovered it at Terrington Car, near Castle Howard, in Yorkshire, in 1841, and of which a beautiful figure has been given in a recent number of the 'Supplement to English Botany,' under the name of *R. glandulosus* (*Bellard*), accompanied by an elaborate history of the plant, from the able pen of my friend Mr. Borrer.† Our present plant is distinguished from *Bellardi*, by the longer and more variable prickles, by the angled stem, and by the form of the leaflets, which are obovate, irregularly and rather coarsely serrated in this species, and ovate, regularly and finely serrated in *Bellardi*.

Our Flora scarcely boasts two more elegant and beautiful plants, than these two allied brambles — *R. rosaceus* and *R. Bellardi*.

The next name which appears on the list is that of *R. Lejeunii*, (*W. & N.*) — a name which I did not insert without some slight degree of hesitation, but on further examination for these notes, my doubts certainly diminish. They were however of a two-fold nature, namely,

* *Revue de la Flore*, p. 238.

† *Eng. Bot. Supp. tab. 2983*. It is, I think, to be regretted, that the name of *R. glandulosus*, which is equally applicable to so many species, and which has been so much confounded, should have been taken in 'English Botany' instead of *R. Bellardi* (*W. & N.*), which is now so generally adopted for this species, and so entirely identified with it. The description and history of the plant here given cannot be too highly praised, and the figure is excellent and beautifully executed. I cannot however avoid noticing an anachronism, which the artist has taken the liberty of introducing, namely, that of representing fruit, flower and bud all on the same panicle. The colour of the parts and clothing of the panicle are almost precisely as in *R. rosaceus*, (*W. & N.*)

first, respecting the point whether it should not be considered as a variety of some other species; and secondly, whether my plant be in reality precisely that to which Weihe first gave this name. With respect to the first point, in the absence of sufficient proof I shall not venture to express any decided opinion, but adopt the distinction and nomenclature as they now stand; and with respect to the second point, while the characters of my Selborne plant sufficiently accord with the figure and description of Weihe and Nees, to be considered as the same species, I shall not hesitate to draw up my description from the coincident characters of their and my plant, and afterwards mention those points which would probably make mine to be a variety of *Lejeunii*, should this ultimately be retained as a species, or a sub-variety, should *Lejeunii* lapse into a variety, as I suspect, of another species. The following is a description of the species.

Stem arched, slender, slightly angled, sparingly hairy and glandulose; *prickles* variable, and gradually passing into setæ, a few very long and deflected. *Leaves* quinato-pedate, occasionally ternate; *leaflets* obovato-lanceolate, acuminate, unequally serrated, bright and shining above, paler and pubescent beneath. *Stipulæ* linear, hairy and very glandulose. *Panicle* branched, tomentose, prickly and glandulose; *peduncles* thickly strewed with long white-pointed aciculæ and glands. *Bractææ* numerous, lanceolate, simple or trifid, very hairy and glandulose. *Calyx* broadly lanceolate, acuminate, densely tomentose, reflexed in fruit.

The prickles in this pretty bramble, as mentioned in the above description, are very variable; the majority are small, but a few of the larger ones have thick bases and are somewhat hooked. The leaves are variable, having three, four or five leaflets, which, however, are all pedicellate; * the lower part of the panicle is leafy, with ternate leaves, and armed as the shoot; the upper part and pedicels are covered with a loose tomentum, and thickly strewed with straight fine prickles, red at the base and white at the tip. The flowers are of a very bright rose tint. The whole plant forms a very beautiful shrub, with much the general aspect of the variety β . of *R. carpinifolius*.

The Selborne plant varies from that of Weihe and Nees in having the stem less armed, though with the same description of clothing, and the arch more ascending. This may have arisen from its growing

* The description of the leaf in 'Rubi Germanici' is so happy and characteristic, that I am tempted to transcribe it. "Folia parum distantia, ternata, quaternata vel quinata, et tunc quidem pleraque pedatisecta."—p. 79.

more in the shade, but the effect of the difference is to approximate it more nearly to *R. carpinifolius* β . (*W. & N.*) From this, however, it may be distinguished by the glands and setæ on the growing shoot, which is also less hairy, and by the abundant glands on the panicle, which are only occasionally seen in that species, and I believe never but in the variety β . The prickles of the panicle are very similar in these two species.

The only other form of which I think it necessary to enumerate the distinctive differences, is *R. rosaceus*, from which it may be distinguished by the quinato-pedate leaves, by the whole plant being very much less glandulose, and by the short and tomentose calyx. Other points of distinction were mentioned when speaking of that species.

By the name of *R. rudis* I refer to a bramble which I have seen in different herbaria, and labelled with many different names. It is one form of a most natural group, distinguished by hispid stems and sharp jagged leaves; and it is a matter yet very undecided, how many of the forms of this group should be included as one species, or how far, as species, they should be kept distinct. In the absence of sufficient information on this point, I have chosen the name of Weihe and Nees,* which I confidently conclude to be intended for the form I refer to by this name in the Selborne list, and I have only here to refer to those descriptions in our general Floras, which, under different names, apply to it. I trust, at some future time, I may have some further opportunity of seeing more of these forms, and of observing how far they are or are not specifically distinct.

The form in question I refer to the *R. Radula* of Leighton, *R. Radula*, var. γ . *Hystrix*, of Babington, and to *R. rudis*† of Lindley (both editions). To the latter two authors, under the names here given, I refer for descriptions.

The plant is one of very remarkable appearance; its jagged leaves and hispid stem giving it a very peculiar aspect, but one which is certainly both elegant and handsome.

The next *Rubus* which appears on our list is one which I believe to be an undescribed species, an opinion in which my friend Mr. Babington coincides with me. Having carefully examined it with this gentleman, I adopt for it the name of *Rubus Babingtonii*, in acknowledgment, not only of his successful labours in this difficult genus,

* *Rubi Germanici*, p. 91, tab. xl.

† It appears to me quite evident, that this is the form which Mertens and Koch understand by *R. rudis*.—*Deutsch. Fl.* iii. 503 and 507.

but also of the great obligation under which I feel all British botanists to be to him, for all that he has done to elucidate our Flora. The following is a description of

Rubus Babingtonii. *Stem* very long, arched, terete and channelled, slightly glandulose and hairy, hispid with numerous short, thick prickles, which pass insensibly into setæ. *Leaves* ternate, rarely quinate, green and glabrous on both sides; *leaflets* rhomboido-cordate, cuspidate, irregularly and doubly crenato-serrate, serratures mucronate; *petioles* and *pedicels* prickly and setose; *stipules* linear, hairy. *Panicle* leafy and much branched; primary *rachis* clothed in the lower part as the shoot; the upper portion, branches and peduncles tomentose, prickly and setose; *glands* not numerous. *Leaves* of the panicle ternate or simple, entire at the base, with mucronate crenatures towards the apex. *Bracteas* foliaceous to the summit, broadly lanceolate, hairy and glandulose. *Calyx* broadly lanceolate, cuspidate, hairy.

This species is by far the largest *Rubus* I have ever seen, but I am unable to speak of its exact dimensions, not having measured it. Its hispid stem would place it as a near ally of *R. rudis* (*W. & N.*), while its style of inflorescence would associate it with *Koehleri* or *fusco-ater*, and its tomentose rachis and peduncles with *R. leucostachys* and its allies. To see a bramble of this extraordinary size with ternate leaves is not a little remarkable, and what is still further so is, that the few quinate leaves which did exist, were on the smaller and weaker shoots. The leaves are perfectly free from hairs above, and almost perfectly so, and consequently green beneath; their coarse crenatures too have a remarkable aspect, quite different from any other *Rubus*. The panicle is enormous, being fully two feet in length, and in some instances considerably more. Notwithstanding the enormous size of the other parts of the inflorescence, the fruit is very small, and composed of minute black drupes. The stem, though grooved, is not angled, the prominences left by the grooves being rounded. It is certainly more hispid than any other *Rubus* I have seen.

From *R. rudis* and its other allies—for in this group its hispid stem certainly places it—it may readily be distinguished by the broad leaflets, instead of the narrow jagged ones of those species; from *R. Koehleri* and its allies by the paucity of hairs and glands; lastly, from *R. leucostachys* and its congeners, by the presence of glands and setæ; and from all these by the ternate leaves, with their crenate margins.

Rubus cæsius (L.), the last on our list of Selborne Rubi, need not detain us long, being so well known. It is, however, not a little remarkable, that, loving damp shade as this plant usually does, and abounding as is Selborne in shady streams and woods, the dewberry nevertheless appears here always to choose sunny exposures. It was consequently of rather stout habit, but always trailing; it was, too, notwithstanding such exposure, the true *cæsius*, and not at all inclining to pass into *dumetorum*, which, according to Mr. Lees' opinion, it should have done in such situation.

This remark brings me to speak of my promise (Phytol. ii. 99) to speak of Mr. Lees' third instance of species or supposed species deducible from *R. cæsius*. This instance is mentioned in the paper before quoted, in the 'Transactions of the Botanical Society of Edinburgh' (part iii. p. 177), and refers to a form which Mr. Lees is disposed to call *cænosus*. If this form be, as is there mentioned, Mr. Leighton's "*rharnnifolius*, second form," I think its true affinity will be found, not with *cæsius*, but with *affinis*, as I have already remarked in this paper (Phytol. ii. 101). Mr. Lees also speaks of deriving some form or forms called "*corylifolius*" from this species, but this need not detain us. This term is so vague, and has been so variously applied, that it is not unlikely forms of *cæsius*, as well as of other species, may often have been so called; and I should gather from the tenor of Mr. Lees' remarks, that his experience is the same as mine, when I say that I have not met with a specimen labelled with this name, which might not rightly be referred to some other species. Being thus so totally ignorant what ought to be intended by *R. corylifolius*, I must leave this suggestion of Mr. Lees, only expressing generally the opinion that I believe *R. cæsius* to be one of the most natural of our species, though to a considerable extent a variable one.

Doubtless Selborne contains many other forms of Rubi, besides those noticed in these remarks, but these are all I observed during my "*Three Days' Botanizing at Selborne*," — three days I am not likely soon to forget.

T. BELL SALTER.

Ryde, Isle of Wight, March, 1845.

On the Theory of "Progressive Development," applied in explanation of the Origin and Transmutation of Species. By HEWETT C. WATSON, Esq., F.L.S.

(Continued from p. 113).

My former communication on this subject was intended to have an introductory character only. Two questions arise on the theory of progressive development, as set forth in the 'Vestiges;' namely, first, Can plants originate from unorganized matter?—secondly, Can plants of one species, in any way, produce individuals of another species?

To both of these questions the author of the 'Vestiges' seems ready to give an affirmative reply. But his attempt to base this affirmation upon the ground-work of facts, unfortunately, must be pronounced a thorough failure. Overlooking the best part of the evidence which might be adduced in favour of this hypothesis, he stumbled upon two or three pretended facts, which had been published only to be scouted as absurdly improbable; and which, when rightly examined, are really not in accordance with the theory which he advocates.

To the former of these two questions, our existing knowledge of Biology seems inadequate to afford any satisfactory answer. We can neither assert nor deny that plants do sometimes originate from inorganic matter. The pre-existence of a parent appears always necessary to the production of those species of more complex organization, with the propagation of which we are best acquainted. Yet this constant fact may not hold true with other species of very simple organization. And it should be conceded to those who advocate the theory of progressive development throughout Nature, that only the simplest plants could be expected to originate wholly or solely from inorganic matter. In truth, he is more hasty than philosophic in his judgment, who can believe himself entitled to assert, that the simplest forms of vegetable life (say, for example, a *Protococcus*) never come into existence, unless by the development of germs which have first constituted portions of a parent individual similar to themselves. On this first question, however, I do not wish to enlarge here. It is unsettled, and likely long to remain unsettled.

The second question, bearing on the transition of species, may be taken under consideration independently of any reference to the origin of organic nature. In this consideration we are not restricted to those very simple forms of vegetable life, the diminutive size of which puts insuperable difficulties in the way of correct observations. A pervad-

ing uniformity is everywhere seen in the operations of Nature, which may warrant a presumption that the same rule will hold true here, alike in the complex structures and in the more simply organized plants—whether that rule shall ultimately establish or refute the idea of a transition of species. I use this term “transition,” to signify the production of one species from another, whether it be effected by descent, or in any other mode. And my purpose here is to point out the kind of evidence, upon the validity of which a decision must be made, in forming our opinions upon the matter. This evidence may be conveniently arranged under three general heads : —

1. Inferences which have been drawn from the past history of the earth, and those changes in the character of its Flora which have been brought to light by geological research.

2. The tendency of species to vary ; and hence the production of such intermediate and connecting links between different species, as would warrant a presumption that no permanently impassable limits are assigned to them.

3. Direct facts towards establishing the transition from one species into another.

First, then, it will be conceded that many species of plants formerly flourished on the surface of the earth, which were quite distinct from those now growing around us in their stead. Further, there is good reason for believing that none of the present species existed in those remote periods. And it seems highly probable, if not certain, that past changes in the earth's Flora were effected gradually ; the whole Flora of any one period not being destroyed in the aggregate, to make room for another entirely different Flora ; — but that species after species disappeared, species after species appeared, singly and successively ; no total change occurring at once, unless as a local event, which would not implicate the general Flora of the earth.

It is extremely difficult to account for these changes, by natural means, unless on the hypothetical assumption that one species produced another, under changed conditions of climate or other circumstances. In rejecting that hypothesis, we are thrown upon the supernatural alternative of assuming, quite as gratuitously, a direct and oft-repeated exercise of Creative Power. But this latter assumption is not consistent with anything now seen in Nature, where all seems to proceed uniformly, in accordance with pre-settled laws. Still, gratuitous though it is, the supernatural alternative is the one generally received by the vulgar, and admitted — tacitly, at least — by men of science. The author of the ‘Vestiges’ found this impediment in his

way, and he has accordingly penned some arguments against it, which I will quote in preference to stating my own ideas on the subject. The arguments apply to plants equally as to animals.

"It may now be inquired," he writes,—“In what way was the creation of animated beings effected? The ordinary notion may, I think, be not unjustly described as this, that the Almighty author produced the progenitors of all existing species by some sort of personal or immediate exertion. But how does this notion comport with what we have seen of the gradual advance of species, from the humblest to the highest? How can we suppose an immediate exertion of this creative power at one time to produce zoophytes, another time to add a few marine mollusks, another to bring in one or two conchifers, again to produce crustaceous fishes, again perfect fishes, and so on to the end? This would surely be to take a very mean view of the Creative Power—to, in short, anthropomorphize it, or reduce it to some such character as that borne by the ordinary proceedings of mankind.”

“Some other idea must then be come to with regard to *the mode* in which the Divine Author proceeded in the organic creation.”—p. 153.

There is small likelihood that the stone tablets of Geology will ever yield an explanation of the “mode” by which the exchange of species was brought about in past eras. In the absence of real knowledge we take up an hypothesis which best accords with the facts, when we seek to explain past events by assuming, hypothetically, that one species changed into or produced another.

Secondly, we have to consider whether species are distinguished from each other by definite and permanent characters, or whether they vary to such a degree as may justify a doubt respecting the existence of impassable limits between them. For the present I must write of “species” as commonly understood by botanists, without attempting any rigorous definition of the term, which may hereafter be found to represent only a fiction of the human mind. Philosophical thinkers now regard the larger groupings of systematic Botany, orders and genera, in the light of conventional unions only. But almost all botanists believe species to be something real and permanent in Nature. The prevailing belief apparently is, that individual plants of the same species vary among themselves only within limits comparatively narrow; that they can be distinguished from those of different species by certain peculiarities of structure or form, which are technically called “characters;” that these characters are constantly re-

peated in their descendants; and that the distinctive characters of one species are never assumed by the progeny of another species.

It must be confessed, however, that there is much difficulty in reconciling this belief with the familiar fact, that in many genera the number and distinctions of the supposed species seem to depend pretty much upon the fancy of the botanists who describe them. Thus, in the genera *Salix*, *Rosa*, *Rubus*, *Mentha*, *Viola*, *Festuca*, *Poa*, *Saxifraga*, *Cerastium*, *Hieracium*, *Polygonum*, *Myosotis* and others, the number of species may be held optional with botanical authors. Such a remark may startle some of our great "species-botanists;" and yet, in the short table below, we have something very like a proof of its correctness. The table is intended to show the number of indigenous species in some of these genera, varying according to the author who describes and catalogues them.

		Salix.		Mentha.		Rosa.		Rubus.		Saxi- fraga.
Hudson (1791),	....	18	....	6	....	5	....	5	....	9
Smith (1824—8),	....	64	....	13	....	22	....	14	....	25
Lindley (1835),	....	29	....	9	....	17	....	21	....	24
Hooker (1842),	....	70	....	13	....	19	....	14	....	16
Babington (1843),	....	57	....	8	....	19	....	24	....	20
London Catalogue (1844),		38	....	8	....	7	....	34	....	16

Some few of the species were first discovered in this country during the present century; but these novelties will go only a short way towards making up the wide differences between Hudson and Smith. The grand cause of the varying numbers arises from discordant views about species and varieties; those forms which by one author are described for distinct species, by another are included together as varieties only of the same single species. I select the genera named above, as examples of uncertainty in numbers, because their described species are numerous. Equivalent differences will appear in other genera, where the species are few. Thus, Hudson's solitary (or, dubiously, two) species of *Myosotis* has now expanded into eight. His six species of *Viola* have been increased to ten, although they are now again reduced to six or seven. From his two species of *Betula* we have seen four made, and a fifth is now threatened under the significant sentence of "probably a distinct species." So, on we might go, with the species of many other genera. It will be borne in mind here, that the plants of Britain have been long and carefully studied by many able botanists; and it would hence seem impossible for such differen-

ces of opinion still to exist among them, unless the distinctions and limits of species were truly very uncertain — not to write, arbitrary.

The preceding examples are derived from plants in a state of nature. When brought under cultivation, and it becomes the interest or amusement of cultivators to increase and extend their variations, scarce any limit can be set upon the power of doing so. Our cultivated species of *Pelargonium*, *Erica*, *Rosa*, *Fuchsia* and *Calceolaria*, have now become respectively an undistinguishable intermixture of cross breeds and varieties. The changes brought about in long-cultivated fruits and vegetables seem to prove that varieties of a single species may differ quite as widely among themselves, as do other plants which are usually accounted distinct species. We have examples in the apple, pear, plum, gooseberry, strawberry and grape, among fruits; in the pea, potato and cabbage, among vegetables. To these we might add other examples in florists' flowers; such as the *Dahlia* and pansy, which have been so greatly run into varieties in the course of a few years past.

The numerous and still increasing variations in the species above mentioned, afford clear proofs that the progeny is not necessarily a copy of the parent, varying only in luxuriance or other slight and temporary character. In the course of generations some descendants differ so widely from their ancestral plants, as to appear like distinct species, when they are contrasted against other less changed, or unchanged, descendants from the same ancestors—or, at least, what are supposed to be such. We find, indeed, a conflict of opinion in some cases, whether the wild and the cultivated species have been derived from the same common stock, or whether they have been aboriginally distinct. Let us make a short series, in example of this, where the uncertainty respecting an original identity of stock will become greater and greater. It is generally agreed, I believe, that the wild thorny pear is the original stock of all our garden pears, various though they are. It is not quite so generally allowed, that the wild thorny crab of our hedge-rows is the true stock of the garden apples in their countless varieties. More doubt attaches to the wild sloe or the bullace (or both, as two forms of a single species) in the light of a common stock to all our plums of the garden. And very few botanists seem prepared to receive the wild cherry (*Prunus Cerasus*) as the real stock of the garden cherry (*Prunus avium*). Some of our Cerealia cannot be referred to any known wild stock: whether the original species has ceased to exist in a state of nature, or whether the long-cultivated varieties have lost resemblance to their original stocks, might be made

a question which would not be likely to find any speedy solution in response.

With such examples before our eyes, we are bound to concede to the transitionists, that plants do possess a capability of wide variation from any one form which we may choose to select for the normal or typical form of a species. But are these variations sufficiently wide to give any probability that one species may pass gradually into another? As a reply to this query, I will now cite some few instances of admitted species being tied together (so to speak) by a series of intermediate forms.

According to the usual application of the term, it may be safely assumed that *Geum urbanum* and *Geum rivale* are two distinct species. They are easily distinguished by several well defined characters; and I do not recollect that any botanical authority has united them under a single specific name. Yet intermediate forms between them have long been familiar to botanical eyes, and which have usually been accounted varieties of one or of both the species above named. These intermediate forms have been commonly clubbed together, under the single name of "intermedium;" this name meaning a third species in the estimation of some few botanists, a variety in that of most others, or a series of intermediate varieties in the eyes and ideas of another and smaller section of botanists. The *Geum intermedium* is taken up as a distinct species, by our present great adopter and maker of dubious species, who writes, "If this plant is not a distinct species I do not know to which of the others it should be referred." There is, however, a strong objection against regarding the plant as a "distinct species," in the fact, that it is not one clearly defined form, with characters intermediate between those of two other well marked forms; but that it is really a group or series of intermediate forms, which run into *Geum urbanum*, at one end of the series, while approximating also to *Geum rivale* at the other extremity. Apparently, both species sport into varieties; and these varieties run so near together as to have been combined into one supposed third species.

We obtain another familiar example in the cowslip and primrose. Though some degree of doubt may have been expressed occasionally, the prevailing opinion has clearly been, that *Primula veris* and *Primula vulgaris* are truly distinct species. They are so dissimilar that every country-bred child can distinguish them with the greatest facility. They are extremely abundant in many places; and thousands or tens of thousands may be examined without any decided example

being found which would indicate the transition from one towards the other species. Notwithstanding this, intermediate forms are occasionally seen, which exhibit a series of steps from the common primrose (*Primula vulgaris*) towards the cowslip (*Primula veris*), and which have usually been mistaken, in this country, for a different species (*Primula elatior*, of Jacquin). On the other side, there is a variety of the cowslip which makes a considerable step towards the primrose, in its larger, paler, and nearly flattened limb of the corolla. This latter is the *Primula veris*, var. *major*, of the London Catalogue. It has been supposed that those varieties of the primrose which approximate nearest to the cowslip, are hybrids or mule-breeds between the two received species. This conjecture may be correct, although the supposed hybrid wants one of the peculiarities usually expected in true mules; namely, that of sterility. (See Phytol. i. 9, 232, 1001).

It would not be difficult to adduce other examples of two reputed species apparently passing one into the other by intermediate varieties. But in the pages of a monthly periodical I can give only few examples in any detail. In most instances, perhaps, where two alleged species are thus connected by intermediate varieties, the distinctness of the two species is called in question for that very reason. Thus, in the eyes of some botanists, the cases would resolve themselves into examples of variation in single species, rather than instances of connecting links between two species. *Teucrium scordioides* passes into *Teucrium Scordium*, by a gradual variation of character; but the former is rightly deemed a dubious species. So also of *Erica Mackaiana*, a very dubious species, which may be traced, step by step, into a form scarce distinguishable in any way from *Erica Tetralix*. *Betula glutinosa* passes into *Betula alba*; *Veronica humifusa* shades into *Veronica serpyllifolia*; *Rumex conglomeratus* into *Rumex sanguineus*; *Avena alpina* into *Avena pratensis*; *Festuca loliacea* into *Festuca pratensis*; *F. pratensis* into *F. elatior*; *F. elatior* into *F. arundinacea*; *Viola lactea* into *Viola flavicornis*; *V. flavicornis* into *V. canina*; &c. &c.

From such facts as these — whether seen in the wilds, produced in the gardens, or recorded in books — are we not forced to concede to the transitionists, that the notion of permanently impassable limits between species, whether true or false in itself, wears rather a doubtful aspect at present? Still, we cannot altogether concede that the mere existence of wide varieties, or of intermediate forms between alleged species, will sufficiently warrant a presumption against the reality of such limits. Moreover, it is to be remembered, that some

species stand isolated from all others by broad characters of difference which cannot well be supposed passable at a leap. The Linnæa and the Adoxa are examples of this among our indigenous plants.

We have still to inquire about direct facts towards establishing the transition from one species into another. This will be a difficult subject to treat, because the very definition of the term "species," as usually given, involves an assumption of non-transition; so that any ease of real transition—supposing such a case to be adduced—would be set down simply as evidence to disprove the duality of the species. I must reserve this inquiry for another communication, lest it should extend the present paper to a length incompatible with the limits of the 'Phytologist.'

HEWETT C. WATSON.

Thames Ditton, April, 1845.

A List of the Musci and Hepaticæ of Yorkshire.

By Mr. RICHARD SPRUCE, F.B.S.

As I am on the point of setting out on a Botanical expedition to the Pyrénées* and the south of Spain, and it is quite uncertain what length of time may elapse ere my return, I venture to solicit your insertion in 'The Phytologist' of the following list of Yorkshire Musci and Hepaticæ, which includes all the mosses that have been added to the Flora of the county since the publication of Mr. Baines's work. As a mere *list* of Yorkshire species, it is as complete as I have it in my power to make it, but the pressure of preparation for my intended

* My object in visiting the Pyrénées is to collect and publish the flowering-plants, Mosses, Hepaticæ and Lichens of those mountains. I hope to have the Phanerogamic portion of the collection ready for sale in London by the end of autumn; the accurate determination of the species of the Cryptogamia will be a work of time, but they will appear as early as possible after the flowers, and I propose to publish them in the style of Drummond's 'Musci Americani.' Those of the readers of 'The Phytologist' who have been in the habit of receiving specimens from me, will be able to form an idea of the manner in which my Pyrenean collections will be got up, and I much regret that the confining nature of my profession has prevented me from cultivating so extensive a botanical correspondence as I could have wished. I may add, however, that the specimens will be as perfect in every respect as it is possible to procure and to render them.

I contemplate, ere my return to England, to devote several months to the examination of Andalusia, and especially to the Sierra Nevada, with the same objects in view. The vegetable productions of this rich but imperfectly known country are more interesting than even those of the Pyrénées, and I have reason to anticipate the discovery of many novelties.

journey has prevented me from giving so many localities as I could have wished, and from adding remarks on several of the new and little-known species, which would have made it more valuable and interesting. The nomenclature is chiefly that of the 'Bryologia Europæa,' with the addition (when necessary) of the synonymes of Smith's 'English Flora,' vol. v. part 2, our latest authority on the subject of British mosses. The species not included in Baines's 'Yorkshire Flora' are marked with *one* asterisk, and those not described in the 'English Flora' with *two*. The Hepaticæ are not inserted at all in Baines's 'Flora,' and no complete list of the Yorkshire species has been previously published. The very few localities which I have introduced, without having seen a specimen from them, are included in inverted commas; but they are on what I consider unexceptionable authority. The Yorkshire mosses here enumerated amount to 297 species, and the Hepaticæ to 76. Perhaps no other county can show numbers approaching to these, but it may be said that this is sufficiently explained by its exceeding every other in extent. However, more than half of it yet remains to be explored, and Yorkshire Bryologists are "few and far between." Besides, in tracts of country of very limited extent that have been well investigated, as great a number of species has been found as anywhere in England, within the same space. For instance, within a circle of one mile from the High Force of the Tees, 40 species of Hepaticæ have been found; and on Stockton Forest, near York, I have gathered, on about an acre of ground, 29 species of the same tribe, all, with a solitary exception, in fructification.

MUSCI.

AMELYDON (*Bryum* Eng. Fl.)

dealbatus Pal. Beauv. Stansfield moor,
near Todmorden, Mr. Nowell.

ANACALYPTA (*Weisia* Eng. Fl.)

lanceolata, Köhl.

**Starkeana*, Br. Germ. Clifton Scope,
near York. The scabrous calyptra
of this species, though omitted by
Bruch and Schimper, affords an
excellent character to distinguish it
from *A. lanceolata*.

ANDREA.

**alpina*, Hedw. Teesdale.
Rothii, Mohr.
rupestris, Hedw.

ANCECTANGIUM.

ciliatum, Hedw.

ANOMODON.

curtipendulum, H. and T.

ARCHIDIUM.

**phascoides*, Brid. (*Phascum alternifolium* H. and T.) Stockton Forest
and Langwith Moor, where it fruits
freely. The *Phascum alternifolium*
of the Yorkshire Flora is the young
of some other moss; probably of
Dicranum varium.

AULACOMNIUM (*Bryum*, Eng. Fl.)

androgynum, Schwgr.
palustre, Schwgr.

BARTRAMIA.

arcuata, Brid.

****calcareæ**, B. et S. Teesdale. Under the New River bridge at Castle Howard. Rievaulx and Heseltine Gill; W. Borrer, Esq. Shedding Clough; Mr. Nowell.

fontana, Brid.

***Halleriana**, Hedw. Teesdale.

ithyphylla, Brid.

Ederi, Sw. (*B. gracilis*, Floerke).

pomiformis, Hedw.

BRYUM.

****acuminatum**, B. et S. Teesdale.

alpinum, L.

****annotinum**, Hedw. The gemmiferous state of this moss is very frequent; the fruit I have seen only in Teesdale and on Stockton Forest.

argenteum, L.

****atropurpureum**, W. et M. Very frequent near York and Castle Howard.

****bimum**, Schreb. (*Br. ventricosum ex parte*, Eng. Fl.) Frequent in the low grounds: Stockton Forest and other places near York.

cæspitium, L.

capillare, Hedw.

carnaeum, L.

****cavifolium**, Tayl. MSS. Maize beck, and in a stream on Holwick Fell, Teesdale.

****cernuum**, B. et S. Teesdale; Castle Howard, &c. Rather scarce near York. Greta Bridge, June, 1810; W. Borrer, Esq., Stansfield Moor; Mr. Nowell.

***crudum**, Schreb. Teesdale. Ratton Clough, near Todmorden; Mr. Nowell.

elongatum, Dicks. Shady rocks on Walsden Moor, near Todmorden; Mr. Nowell.

****erythrocarpon**, Schwgr. Plentiful and very fine in moist sandy stubbles between Barmby and Wood-

house Moors, near Pocklington. Stockton Forest.

****gracilentum**, Tayl. MSS. Waste ground at Ganthorpe.

****inclinatum**, B. et S. Very frequent both in the high and low grounds.

****intermedium**, Brid. Frequent on heaps of rubbish and on mortar in walls, as well as in moist sandy situations.

julaceum, Sm.

****nnioides**, Wils. (*Mnium pseudopunctatum*, B. et S. in Lond. Journ. of Bot.) On Stansfield, Langfield and Walsden Moors, near Todmorden, where it was discovered by Mr. J. Nowell.

nutans, Schreb.

****obconicum**, Hornsch. Near Barnard Castle. In the park quarry at Castle Howard. Greta Bridge; W. Borrer, Esq.

pallens, Sw. Frequent both in the high and low grounds. After deliberately considering the subject, I cannot venture to say that we have *Bryum turbinatum* in Yorkshire, or even in Britain; all the specimens I have seen under that name, as well as the figure in Musc. Brit., appearing to belong to *Br. pallens*. I have a moss from Teesdale, which may, perhaps, be correctly referred to *Br. turbinatum*, but the fruit is too young to allow me to decide.

****pallascens**, Schwgr. Teesdale.

pseudotriquetrum, Schwgr. (*Br. ventricosum ex parte*, Eng. Fl.) Abundant in the subalpine parts of the county; scarcely descending to the plains.

pyriforme, Hedw. Walls at Heworth, near York. On the bridge across the Wharfe at Thorp Arch. Near Hebden Bridge; Mr. S. Gibson.

roseum, Schreb.

****torquescens**, B. et S. On a stone

near Gormire lake, June, 1844; DICRANUM.

W. Borrer, Esq.

**uliginosum*, B. et S. Heslington fields, near York. Abundant on the eastern coast, where it has been seen by myself and Mr. Ibbotson, at points 20 miles asunder, often growing half covered with the sand of the sea-shore. On tufa under the New River Bridge at Castle Howard.

Wahlenbergii, Schwgr. (*Br. albicans*, Eng. Fl.)

Zierii, Dicks. Teesdale.

CAMPYLOPUS (*Grimmia*, Eng. Fl.)

saxicola, Brid. Merriek's Gill, Hackness.

CATOSCOPIUM (*Weissia*, Eng. Fl.)

**nigritum*, Brid. In the second field from the Tees, between Whey-syke house and Harewood Bourn; Mr. R. B. Bowman.

CEPHALOGONIUM (*Dicranum*, Eng. Fl.)

flexuosum, B. et S.

CERATODON (*Didymodon*, Eng. Fl.)

purpureus, Brid.

CINCLIDOTUS.

fontinaloides, Pal. Beauv.

CLIMACIUM (*Hypnum*, Eng. Fl.)

dendroides, W. et M.

DALTONIA.

heteromalla, H. et T. Eskdale. Castle-Howard.

Bruntoni, Sm. (*Didymodon*, Eng. Fl.) *cerviculatum*, Hedw.

denticulatum, B. et S. (*Weissia striata* β : *major*, Muse. Brit.) Green's Clough, Cliviger, Todmorden; Mr. Nowell.

Dillenii, Tayl. (*D. scoparium* and *vulgare*, Eng. Fl.)

flavescens, Sm.

**fugax*, B. et S. (*Weissia striata* α : *minor*, Eng. Fl.) Wharfedale.

**fuscescens*, Turn. Teesdale.

glaucum, Hedw.

heteromallum, Hedw.

pellucidum, Sw.

rufescens, Turn. Castle-Howard park-quarry.

**Schreberi*, Hedw. Ditch on the W. side of the Temple Rush, Castle-Howard.

scoparium, Hedw.

spurium, Hedw. Discovered on Barmby Moor above 70 years ago, by Mr. Teesdale, and figured in Eng. Botany from that locality. It still grows there, and fruits sparingly. In a barren state I have found it also on Stockton Forest and Langwith Moor.

squarrosus, Schrad.

**Starkii*,† W. et M. ? Holwick Scarr, Teesdale.

† This is the "*D. strumiferum*" of my Teesdale list, and was so named from a specimen given me by Dr. Taylor, purporting to be a portion of the original specimen described in '*Muscologia Britannica*;' but having since had an opportunity of comparing it with the example of *D. strumiferum* in Moug. and Nestler, I am satisfied that it is a very different species. Mr. Wilson refers it to *D. Starkii*, and perhaps correctly; it differs, however, from all the specimens of *D. Starkii* in my possession in the following particulars. Leaves patent or subsecund, concavo-canaliculate, subulate or subulato-setaceous from a lanceolate base (subulate in the other), of a darker colour, the nerve rather stronger, and in the uppermost leaves continued beyond the pagina; those of the perichætium tapering more suddenly into longer and more rigid points. The male inflorescence consists of gemmæ dispersed along the stem, in the axils of the leaves, while in *D. Starkii* they are seated at the base of the female flower. Pedicel stouter. Capsule wider, the outer paries less delicate. Operculum with a longer beak. Teeth less deeply cloven, and crura shorter.

- *undulatum*, Brid. (*vide Bruch*). Stockton Forest; Terrington Carr; Welburn Moor, and other places. The *D. undulatum* of the Yorkshire Flora is *D. Dillenii*.
varium, Hedw.
- DIDYMODON.**
capillaceus, Schrad.
**cylindricus*, B. et S. (*Weisia cyl.*, Brid.; *W. tenuirostris*, H. et T.) Eskdale. The *Didym. cylindricus* of Eng. Flora is a totally different plant.
flexifolius, H. et T.
- DIPHYSCIUM.**
foliosum, W. et M. "Near the High Force and Cauldron Snout;" W. D. C. Trevelyan, Esq.
- DRYPTODON** (*Trichostomum*, Eng. Fl.)
acicularis, B. et S.
- ENCALYPTA.**
ciliata, Hedw. Teesdale.
rhaptocarpa, Schwgr.
streptocarpa, Hedw.
vulgaris, Hedw.
- FISSIDENS.**
adiantoides, Hedw.
bryoides, Hedw.
**crassipes*, Wils. MSS. On stones in Crambeck.
**incurvus*, Schwgr. In grassy places near York.
 var. (f) *pusillus*. (f. *pusillus*, Wils. MSS.) Fréquent on sandstone near Castle-Howard.
**osmundioides*, Hedw. White Force, Teesdale, intermixed with *Zygodon Mougeotii*.
taxifolius, Hedw.
- FONTINALIS.**
antipyretica, L.
squamosa, L. "In the Tees above Middleton;" Winch, Flora of Northumb., &c.
- FUNARIA.**
hygrometrica, Hedw.
Mühlenbergii, Schwgr.
- GRIMMIA.**
apocarpa, Hedw.
Doniana, Sm.
pulvinata, Sm.
**spiralis*, H. et T.
**torta*, Hornsch. et N.
trichophylla, Grev.
- GYMNOSTOMUM.**
curvirostrum, Hedw.
Donianum, Sm. Mowthorpe Dale and Crambeck, near Castle Howard.
rupestre, Schwgr.
tenuis, Hedw. Fruiting on the Sandy-hill-bridge, Castle-Howard park; in other situations in the same neighbourhood, but barren. Thorp Arch.
- HEDWIGIA.**
**æstiva*, Hook. Teesdale. Green's Clough, near Todmorden; Mr. Nowell.
- HOOKERIA.**
lucens, Sm.
- HYMENOSTOMUM** (*Gymnostomum*, Eng. Fl.)
microstomum, R. Br.
- HYPNUM.**
aduncum, L.
albicans, Neck.
algerianum, Brid. (*H. tenellum*, Dicks.)
alopecurum, L.
**Blandovii*, W. et M. Terrington Carr; Mr. Ibbotson and R. S.
brevirostre, Ehrh.
**caespitosum*, Wils. Roots of trees near York, and by the river Cock, near Tadcaster.
catenulatum, Schwgr.
commutatum, Hedw.
confertum, Dicks.
cordifolium, Hedw.
crassinervium, Tayl. (*H. pseudo-piliferum*, B. et S.) On limestone throughout the county, rarely fruiting, but found in that state in Mowthorpe Dale.
Crista-castrensis, L. Castle-Howard park; Mr. Ibbotson. "Found in

fructification on the S. side of the Tees, near Gainford, by Mr. Backhouse ;" Winch, Flora of Northumb. &c.

cupressiforme, L.

cuspidatum, L.

denticulatum, L.

****elodes**, Spruce in London Journ. of Bot. Stockton Forest, growing with *H. scorpioides*.

filicinum, L.

flagellare, Dicks.

fluitans, L.

****incurvatum**, Schrad. Teesdale.

julaceum, Schwgr. (*H. moniliforme*, Eng. Fl.) Pennyghent ; Mr. Ibbotson.

loreum, L.

lutescens, Huds.

molluscum, Hedw.

multiflorum, Tayl. Everywhere, with *H. cupressiforme*, from which Bruch will not admit that it is distinct.

murale, Hedw. Abundant in the limestone districts. On decayed posts by the Ouse at York.

myosuroides, L.

nitens, Schreb. Abundant and fruiting copiously in Terrington Carr, where it was first observed by the Rev. J. Dalton, and more recently by Mr. Ibbotson, who finds it also near Rievaulx Abbey, and in a bog below the Head Hagg, Coneysthorpe.

****nitidulum**, Wahl. (*vide Bruch*). Gorpley Clough, near Todmorden ; Mr. Nowell. This is a different moss from *H. pulchellum*, Dicks.

palustre, L.

***piliferum**, Schreb. Near York, Malton, and Castle-Howard. In Mowthorpe Dale the ground is in many places completely carpeted with this moss, bearing a profusion of capsules.

plumosum, L.

****polymorphum**, Hedw. (*nec Eng. Fl.*)

On wet limestone at Crambeck, and on the ruins of Kirkham Abbey.

populeum, Hedw.

praelongum, L.

proliferum, L.

pulchellum, Dicks. Teesdale.

****pumilum**, Wils. MSS. (*H. Teesdalii*, Dicks. ?) Mowthorpe Dale, on calcareous rocks. Mr. Teesdale's localities for *H. Teesdalii* are "on trunks of trees in woods at Castle-Howard, about the year 1770 ; and roots of trees near Beverley." *H. pumilum* may be the same species, but I have certainly never seen it on trees, though I have gathered it in several stations, both in England and Ireland.

purum, L.

riparium, L.

rugulosum, W. et M. Teesdale and on Pennyghent ; Mr. Ibbotson.

ruscifolium, Neck.

rutabulum, L.

salebrosus, Hoffm. Frequent in sandy and limestone districts, but I have seen fruit only on Stockton Forest.

Schreberi, Willd.

scorpioides, L.

serpens, L.

splendens, Hedw.

squarrosus, L.

stellatum, Schreb.

stramineum, Dicks. In fruit on Stansfield Moor, May, 1844 ; Mr. Nowell.

striatum, Schreb.

triquetrum, L.

uncinatum, Hedw. Teesdale.

undulatum, L.

velutinum, L.

ISOETHECIUM (*Hypnum*, Eng. Fl.)

curvatum, B. et S.

***polyanthum**, B. et S. On trees by the Foss, near York, and near Huntington. Tree-stump in Ascham bogs. Near Castle-Howard and Crambe, but sparingly. The *Hypnum* poly-

anthus of the Yorksh. Flora is *H. multiflorum*.

sericeum, B. et S.

LESKEA.

incurvata, Hedw. (*H. atrovirens*, Dicks.)
polycarpa, Ehrh. (*H. medium*, Dicks.)

****pulvinata**, Wahl. Abundant on trees in situations liable to inundations from the Ouse, near York. By the Cock, near Tadcaster.

****Sprucii**, Bruch. (*H. confervoides*, Musci Americani; Spruce in Bot. Soc. Trans.; nec Bridel). Teesdale.

viticulosa, B. et S. (*Anomodon*, H. et T.)

LEUCODON.

sciuroides, Schwgr.

MEESIA.

uliginosa, Hedw. (*Bryum trichodes*, Eng. Fl.) Teesdale.

MNIUM (*Bryum*, Eng. Fl.)

***affine**, Schwgr. Frequent near York and Castle-Howard. Fruiting sparingly in Terrington Carr.

cuspidatum, Hedw.

hornum, Hedw.

punctatum, Hedw.

rostratum, Schwgr.

serratum, Brid. (*Br. marginatum*, Dicks.)

****stellare**, Hedw. Gilla Leys Wood, Crambeck, near Castle-Howard; Jan., 1841. Mowthorpe Dale, with perichætia; Jan., 1843. Near Todmorden; Mr. J. Nowell. Ettersgill Beck, Teesdale; Mr. Ibbotson.

****stygium**, B. et S. (*Cinclidium*, Wahlenb.)

undulatum, Hedw. (*Br. ligulatum*, E. Fl.)

NECKERA.

complanata, B. et S. (*Hypnum*, Eng. Fl.)

crispa, Hedw.

pumila, Hedw.

CEIDPODIUM.

"*Griffithianum*, Schwgr.;" Rev. J. Dalton.

OMALIA (*Hypnum*, Eng. Fl.)

trichomanoides, B. et S.

ORTHODONTIUM.

****gracile**, Schwgr., Wils. Rocks near the Strid, Wharfedale.

ORTHOTRICHUM.

affine, Schrad.

anomalum, Hedw.

****coarctatum**, Pal. Beauv. Frequent in the Castle-Howard woods.

crispum, Hedw.

cupulatum, Hoffm.

diaphanum, Schrad.

Drummondii, H. et Gr. Teesdale. Lowdale wood, Hackness.

****fastigiatum**, Bruch. By a footpath between Greta Bridge and Rokeby; June, 1810; W. Borrer, Esq.

***Hutchinsiae**, H. et T. On stones in the Greta; W. Borrer, Esq. The *O. Hutchinsiae* of the Yorksh. Flora is *O. anomalum*.

leiocarpum, B. et S. (*O. striatum*, Eng. Fl.)

Lyellii, H. et T. (The *O. Ludwigii* of the Yorkshire Flora is *O. crispum*).

****pallens**, Bruch. On a willow in Clifton Ings, near York, with *O. Sprucii*; June, 1842.

****phyllanthum**, B. et S. On a tree on the S. side of Heslington Fields, near York.

pulchellum, Sm.

****pumilum**, Schwgr. On an ash-tree in Clifton Ings.

***rivulare**, Turn. Balderdale.

rupestre, Schleich. Teesdale.

speciosum, Nees.

****Sprucii**, Montague. Frequent on trees and shrubs on the banks of the Ouse, Wharfe and Cock.

****stramineum**, Hornsch. Teesdale. Frequent in the neighbourhood of Castle-Howard, growing chiefly on beech-trees.

****tenellum**, Bruch. Very fine on trees by the Cock, near Tadcaster. Castle-Howard.

PALUDELLA.

**squarrosa*, Schwgr. Abundant and very fine in Terrington North Carr, where it was discovered by Mr. Ibbotson.

PHASCUM.

***alternifolium*, Bryol. Eur. Frequent near York. Kirkham-hill and other places near Castle-Howard. Teesdale.

**bryoides*, Dicks. In waste ground at Ganthorpe, near Castle-Howard.

In old stone-quarries near Welburn.

crispum, Hedw.

***curvicollum*, Hedw. On the wolds between Beverley and Market-Weighton;" Mr. Teesdale.

cuspidatum, Schreb.

***Floerkeanum*, W. et M. Frequent in autumn in stubble-fields near Castle-Howard. *Var. β . badium*. In a field on the S. side of Bulmer Hagg.

muticum, Schreb.

nitidum, Hedw. (*Ph. axillare*, Dicks.)

**patens*, Hedw. Ditches by the Foss, near York. Temple Rush, Castle-Howard.

**rectum*, Sm. On a bank between York and Skelton, very scarce. "On a bank in Mackershaw Wood;" Mr. Brunton. "On the wolds between Beverley and Market-Weighton;" Mr. Teesdale.

serratum, Schreb.

subulatum, L.

PHYSCOMITRIUM (*Gymnostomum*, Eng. Fl.)

ericetorum, De Not. (*fasciculare*, Eng. Fl.)

***fasciculare*, B. et S. Stockton Forest.

pyriforme, B. et S.

POLYTRICHUM.

commune, L.

***formosum*, Hedw. Woods near Castle-Howard, &c.; more frequent than *P. commune*. This is the *P. gracile* of my Teesdale mosses.

juniperinum, Hedw.

β . alpestre. Teesdale. Todmorden; Mr. Nowell.

piliferum, Schreb.

(*Subgenus Atrichum*).

undulatum, Hedw.

(*Subg. Oligotrichum*).

hercynicum, Hedw.

(*Subg. Pogonatum*).

aloides, Hedw.

alpinum, L.

nanum, Hedw.

urnigerum, L.

POTTIA (*Gymnostomum*, Eng. Fl.)

cavifolia, Ehrh. (*G. ovatum*, Eng. Fl.)

**Heimii*, B. et S. Thorp Arch. In the multangular tower at York.

minutula, B. et S. (*G. conicum*, E. Fl.) Frequent near York and Castle-Howard.

truncata, B. et S.

PTEROGONIUM.

**gracile*, Sw. Falcon Clints, Teesdale.

PTYCHOMITRIUM (*Trichostomum* Eng. Fl.)

polyphyllum, B. et S.

RACOMITRIUM (*Trichostomum*, Eng. Fl.)

canescens, Brid.

fasciculare, Brid.

heterostichum, Brid.

lanuginosum, Brid.

**microcarpon*, Brid. Teesdale. (The *Trichost. ellipticum* of the Yorksh. Flora is an error).

SCHISTOSTEGA.

osmundacea, W. et M. Dule's-gate, near Todmorden; Mr. Nowell.

SPHAGNUM.

acutifolium, Ehrh.

***compactum*, Schwgr. Stockton For.

***contortum*, Schultz. Stockton Forest and Terrington Carr. Stansfield Moor; Mr. Nowell.

β . obovatum, Wils. MSS. (*S. laxifolium*, Valentine). Stockton Forest.

cuspidatum, Ehrh.

cymbifolium, Sw. (*S. obtusifolium*, Eng. Fl.)

***molluscum*, Bruch. Stockton Forest and Barmby Moor.

squarrosus, W. et M.

SPLACHNUM.

ampullaceum, L.*sphaericum*, Hedw.

(Subgenus Tetraplodon).

"angustatum, L. fil. Ingleborough ;"

Sir W. J. Hooker.

mnoides, L. fil. Teesdale.

TETRAPHIS.

pellucida, Hedw.TETRODONTIUM. (*Tetraphis*, Eng. Fl.)*Brownianum*, Schwgr. Newtendale.

Merrick's Gill, Hackness. Teesdale.

TRICHOSTOMUM (*Didymodon*, Eng. Fl.)***aquaticum*, Brid. ? (*fidé Wilson*).

Near Malham, 1837 ; Mr. Wilson.

Settle ; Mr. Borrer. In an old quarry near Welburn ; R. S.

crispulum*, Bruch. Cliffs N. of Scalby Mills, near Scarbro'.*cylicindricum*, Hedw. (*Didymodon*, Eng. Fl.) Castle-Howard park quarry.*flexicaule*, B. et S. Very frequent in the limestone districts.*homomallum*, B. et S. (*Didym. heteromallus*, Eng. Fl.)**mutabile*, B. et S. (*D. brachydontius*, E. Fl.) Scalby mills.*rigidulum*, Smith.*tophaceum*, Brid. (*D. trifarium*, Eng. Fl.)***tortile*, Schrad. In the park-quarry at Castle-Howard ; Mr. Ibbotson and R. S. Var. β . (*Didym. pusillus*, Hook.) In the same locality:

TORTULA.

aloides, B. et S. (*T. rigida*, Eng. Fl.)***ambigua*, B. et S. On a mud-capped wall by the roadside, leading out of Malton, towards York. In similar situations at Welburn.*convoluta*, Hedw.*fallax*, Hedw.**laevipila*, Schwgr. Common on trees.***latifolia*, B. et S. Frequent in situations liable to inundation, as on the banks of the Ouse, Derwent, Wharfe, Foss, &c.***marginata*, B. et S. On walls and

rocks of soft sandstone near Castle-Howard ; most abundant in the park quarry.

muralis, Hedw.***papillosa*, Wils. MSS. On elms at Huntington, near York ; May, 1843. Castle-Howard park.*revoluta*, Schwgr. Kirkham-hill.**rigida*, Schultz. (*T. enervis*, H. et G.)

Abundant on mud-capped walls at Crambeck, and near Malton. Scalby, near Scarbro'. Jackdaw Crag, near Tadcaster. Always in limestone soil.

ruralis, Hedw.*subulata*, Brid.*tortuosa*, W. et M.*unguiculata*, Hedw.***vinealis*, Brid. Near Barnard Castle.

WEISSIA.

acuta, Hedw. (The "*Dicranum fulvellum*" of my Teesdale list is a var. of this species).**calcareae*, Hedw. On chalk-stones near Bishop-Burton, rare ;" Mr. Teesdale.*cirrhata*, Hedw. (The *W. crispula* of the Yorkshire Flora is a var. of *Trichostomum rigidulum*, in which the 32 twin teeth of the peristome are united into 16.)*controversa*, Hedw.*curvirostra*, H. et T.*nuda*, H. et T.*pusilla*, Hedw. On limestone rocks in Mowthorpe Dale and at Crambeck, Castle-Howard : a form almost intermediate between *W. pusilla* and *calcareae*.*recurvata*, H. et T.*trichodes*, H. et T. (*Brachyodus trichodes*, B. et S.) Abundant on sandstone near Castle-Howard.*verticillata*, Schwgr. Crambeck. Forge Valley, near Hackness. Eskdale. Knaresbro' ; Mr. T. B. Powell. Near Middleton-Teesdale ; Mr. Robertson.

ZYGODON.

- **lapponicus*, B. et S. (*Gymnostomum*, Eng. Fl.) Caldron Snout, Teesdale.
 ***Mougeotii*, B. et S. On moist rocks in elevated situations throughout the county.
viridissimus, B. et S. (*Gymnost.* Eng. Fl.) Everywhere common on trees, &c., but rarely fruiting.

HEPATICÆ.

ANTHOCEROS.

punctatus, L.

FEGATELLA.

conica, Tayl.

JUNGERMANNIA.

albicans, L.

asplenioides, L.

Bantriensis, Hook. MSS. Teesdale.

Var. *β. minor*, Spruce. Teesdale.

Var. *γ. muscicola*, Spruce. Teesdale.

barbata, Schreb. Teesdale. Wharfedale. Todmorden; Mr. Nowell.

Var. *β. minor*. Wharfedale.

bicuspidata, L.

bidentata, L.

Blasia, Hook. Ditch-bank at Huntington, near York. In fruit in Hareleywood, near Todmorden; Mr. Nowell.

bysacea, Roth.

calycina, Taylor. Clifton Ings, near York. Clayey bank by the Derwent, opposite Kirkham Abbey. Banks of the Wharfe, opposite Bolton Abbey; Mr. Wilson.

capitata, Hook. Bank at Wigginton Bar, near York.

ciliaris, L. Frequent on heaths, especially in the neighbourhood of York. Stansfield Moor; Mr. Nowell.

complanata, L.

compressa, Hook. Rivulets on Stansfield Moor, in fruit; Mr. Nowell.

concinata, Lightf. Teesdale. "Brimhem rocks;" Mr. Teesdale.

conivens, Dicks. Woods and heaths, frequent.

cordifolia, Hook. Teesdale.

crenulata, Smith.

Dicksoni, Hook. Teesdale.

dilatata, L.

echinata, Tayl. Teesdale.

emarginata, Ehr.

epiphylla, L.

excisa, Dicks. Heaths and banks.

This species varies exceedingly.

exsecta, Schmid. Langwith and Strensall Moors.

Francisci, Hook. Stockton Forest and Barmby Moor. The fruit was gathered by myself and Mr. Borrer on Langwith Moor in May, 1844.

furcata, L.

hamatifolia, Hook. "Yorkshire;" Sir W. J. Hooker.

Hookeri, Lyell. In fruit on Barmby Moor, Nov. 5, 1842; Mr. R. G. Hibbert Ware and R. S.

hyalina, Lyell MSS. Eskdale.

incisa, Schrad. Moors near York, where it fruits in spring and autumn.
inflata, Huds. Frequent on heaths. In fruit on Langwith and Strensall Moors.

interrupta, (*Plagiochila interrupta*, Nees.) Moist rocks at the Strid, Wharfedale. This is the "var. of *J. asplenioides* with entire leaves" of my list of Wharfedale Mosses. (See Phytol. i. p. 107).

julacea, L. "Rocks in the West Riding. Brimham rocks; Mr. Teesdale.

lanceolata, L. On stones in Lythebeck, Eskdale, where it bears fruit.

laxifolia, Hook. Teesdale and Eskdale.

Lyellii, Hook. Goadland beck, Eskdale. Teesdale.

Lyoni, Tayl. Teesdale.

minuta, Crantz. Todmorden; Mr. J. Nowell. "Woods near Richmond, creeping on some species of *Hypnum*;" Mr. Teesdale.

multifida, L.

var. palmata. Callidge Wood, Castle-Howard.

nemorosa, L.

obtusifolia, Hook. Moist sandy banks on Stockton Forest and Langwith Moor, where it fruits abundantly in the spring months.

platyphylla, L.

punguis, L.

polyanthos, L. Frequent in the sub-alpine parts of the county.

pubescens, Schrank. Teesdale. Wharfedale. Gordale, near Settle; Mr. Nowell.

pumila, With. Castle-Howard park. Thorp Arch.

pusilla, L.

reptans, L.

resupinata, L. Teesdale; Mr. Robertson.

riparia, Tayl. Eskdale. Wharfedale. Teesdale. Crambeck. Wet rocks in Shedding Clough; Mr. Nowell.

scalaris, Schrad.

serpyllifolia, Dicks. Mowthorpe Dale; Wharfedale; Teesdale, &c.

setacea, Web. Heaths, &c., frequent.

sphaerocarpa, Hook. Wharfedale. Eskdale. Hareleywood, near Todmorden, where Mr. Nowell gathers it in a fine state of fructification.

Sphagni, Dicks. Moors near York. The fruit was found on Strensall Moor by Mr. Ibbotson and myself, May 9th, 1842.

spiculosa, Dicks. Teesdale. Stipercden Clough; Mr. Nowell. Pennyghent; Mr. Ibbotson. Rather rare in the county.

Tamarisci, L.

Taylori, Hook. Teesdale. Near Todmorden; Mr. Nowell.

tomentella, Ehr. Gilla Leys, near Castle-Howard. Bolton woods, Wharfedale, abundant and beautiful. In other parts of the county, but not common.

Trichomanis, Dicks.

trichophylla, L. Teesdale. Wharfedale. Eskdale.

trilobata, L. Todmorden; Mr. Nowell.

turbinata, Wils. Moist limestone rocks, frequent.

ulicina, Tayl. MSS. Wharfedale. Todmorden; Mr. Nowell.

umbrosa, Schrad. Eskdale. Castle-Howard park.

undulata, L.

viticulosa, L. Dulesgate, near Todmorden; Mr. Nowell. "On stones in rivulets at Hawnby hills and Malham Cove;" Mr. Teesdale.

MARCHANTIA.

androgyna, L. Teesdale, abundant. Thorp Arch.

polymorpha.

RICCIA.

crystallina, L.

fluitans, L. Ditches by the Foss, near York. "About Beverley, with the next species;" Mr. Teesdale.

natans, L. "In ditches and ponds near Beverley;" Mr. Teesdale.

SPHEROCARPUS.

terrestris, Sm. "Fallow fields near Beverley; Mr. Teesdale.

TARGIONIA.

hypophylla, L. "Near Keighley; Mr. Knowlton. "Mossy places in Yorkshire;" Dr. Richardson.

RICHARD SPRUCE.

Welburn, Yorkshire, 1845.

Proceedings of Societies.

BOTANICAL SOCIETY OF EDINBURGH.

March 13, 1845. — Dr. Seller, V.P., in the chair.

Robert Balloch, Esq., 177, West Regent St., Glasgow, was elected a non-resident Fellow of the Society.

Numerous donations to the library and museum were announced.

The following communications were read : —

1. On the genus *Closterium* (continued), by Mr. J. Ralfs, Penzance.
2. On *Encyonema prostratum* of Kützinger, by the same.
3. Mr. M'Nab read a continuation of his Journal of a Tour through the United States and the Canadas. The last portion of this journal read before the Society, chiefly related to the botanical aspect of the country immediately to the westward of Kingston; the indigenous thorns and their fitness for forming hedges being particularly described. From Kingston, the party crossed Lake Ontario to Rochester, situated on the American side, a few miles above the mouth of the Genessee river; considerable tracts of shallow water extend for some distance on either side of this river, in which the wild rice grew more luxuriantly than had been hitherto observed. Proceeding upwards, the river becomes narrower but deep, having beautifully wooded banks rising about a hundred and fifty feet on either side, covered chiefly with oaks, elms, hickories, beeches and birches, interspersed with hemlock spruces, white pines and *Arbor-vitæ*s of large size. On the north bank, the black snake-root (*Actæa racemosa*) was abundant, its long spikes of white flowers having a singular effect beneath the shade of the trees. It was not seen on the south bank, but in its place considerable quantities of *Gerardia flava* and *G. quercifolia* were noticed, all richly clothed with flowers; here also several extensive groups of buckthorns (*Hippophae canadensis*) were observed, each plant forming a large silvery looking bush, and when backed by the dark evergreen trees gave a picturesque effect to the landscape.

Crossing Lake Ontario again to Toronto, on the Canadian side, a great difference in the vegetation was remarked. Here, for the first time in Canada, healthy specimens of weeping willows, locust-trees, and Canadian and Lombardy poplars, were met with; and, for the first time in the country, a native forest of *Pinus resinosa*: the trees composing this forest were very tall, but none of the stems measured, exceeded two feet in diameter. Many detached specimens of the black birch or mountain mahogany (*Betula lenta*) were also seen; this is described by Mr. M'Nab as a finely shaped tree, with a wide spreading top, much resembling the beech-trees of Britain—the stems

averaged about two feet in diameter. Here also *Monarda fistulosa* and *Spiranthes tortilis* were found — the latter very sparingly and for the first time.

They next directed their attention to the Peninsula of Toronto, lying about two and a half miles from the city, across an arm of the lake. The soil is poor and sandy, interspersed with marshes. Several species of trees of dwarfish growth were scattered about, the most remarkable being the rose or cone-gall willow (*Salix conifera*); of this many fine specimens were observed, the branches generally terminated by silvery, cone-like excrescences, supposed to be occasioned by insects—which, with the silvery whiteness of the foliage, gave the plants a remarkable appearance. Several other species of willows were noticed on these sandy plains, but none of them appeared to be infested with insects, although the appearance here described is not peculiar to the above species. The *Arbutus Uva-ursi* covered considerable tracts: the Canadian plant is larger than the British, and even differs slightly from that found in the United States; it is called by the Indians *Sacacomis*, they smoke the leaves, and believe them to possess excellent medicinal properties. Few herbaceous plants were picked in bloom, with the exception of *Rudbeckia hirta*, which was in great abundance, although described by American authors as an inhabitant of the Southern States. *Dracocephalum virginianum*, by no means an abundant plant in Canada, Niagara Falls being the station given in botanical books, but there Mr. M'Nab failed to find it: its principal habitats are the mountain meadows of Virginia and Carolina: *Linum virginianum*, *Cyperus flavescens* and *C. castaneus*, *Silene Antirrhina*, *Scutellaria parvula* and *Lathyrus palustris*. On dry loose sand, by the edge of the lake, *Euphorbia polygonifolia* was abundant; while in marshy places *Lobelia Kalmii* formed the greatest part of the vegetation, and was profusely covered with its rich blue flowers.

Specimens of the most remarkable plants were exhibited to the meeting.

BOTANICAL SOCIETY OF LONDON.

April 4th, 1845. — J. E. Gray, Esq., F.R.S., &c., President, in the chair. The Rev. Andrew Bloxam presented specimens of a new British moss (*Fissidens Bloxami*, Wilson), discovered by him at Orton-wood, near Twycross, Leicestershire.

Read, the commencement of a paper by Edward Palmer, Esq., being "Descriptions of Photographic Drawings of Plants." Specimens of the drawings were presented.

MICROSCOPICAL SOCIETY OF LONDON.

March 19, 1845. — Prof. Bell, F.R.S., &c., President, in the chair.

Read, a paper by Edwin Lankester, M.D., F.L.S., B.S.E., &c., "On some abnormal forms of Fungi, with Remarks on their Morphology." The Fungus which led to these remarks, was found by Dr. Lankester in the neighbourhood of Cheshunt, in December, 1844. It was a specimen of *Agaricus personatus*, which was in a decaying state, from the effects of a previous frost. It exhibited in all its parts a normal structure, with the exception of the pileus, in the centre of which, immediately over the insertion of the stipes into the hymenium, a second and smaller hymenium was developed. The gills of this were apparent, and presented towards the light, and its edges were covered with a pileus, which gradually united itself with that of the lower hymenium. There was, however, no appearance of any development of a stipes. On making a section of the whole plant, no connexion between the lower and upper hymenium was discoverable, so that the latter was evidently an independent development. Although too dry to exhibit under the microscope much of the peculiarity of structure of this class of bodies, sufficient was seen to prove that, whatever might have been the character of the lower or normal hymenium, the upper one was of precisely the same nature. In accounting for this appearance, Dr. Lankester considered that in the Fungi, the pileus and stipes were to be regarded as the representatives of the leaves, or nutritive organs in the higher plants, and the hymenium as the analogue of the flower, or reproductive organs, and consequently, that the influence of cold, or of some other external agent, causing an arrest of the development in the vegetable tissue of the Fungus, would be attended with the development of reproductive tissue, such as we know occurs under similar circumstances in the higher forms of plants. That this view of the office of the parts is correct, he considered might be made out by passing from the Fungi to the lichens, from these to the Hepaticæ, mosses and ferns, in which the green parts are undoubtedly the nutritive tissue of the plant, and the analogues of the leaves. In the Fungi, however, it should appear that the whole body must be looked upon as the analogue of the flower in the higher plants, the thallus being, in this family, at its minimum of development. Hence, then, just as the calyx and corolla stand in the relation of nutritive organs to the more especially reproductive stamens and pistils, so the pileus and stipes stand in a similar relation to the hymenium. An abnormal form, figured by Schæffer, presenting two smaller Fungi growing upon the pileus of a larger one, Dr. L. considered as produced in the same manner as double seeds, or proliferous flowers. — *J. W.*

On the Theory of "Progressive Development," applied in explanation of the Origin and Transition of Species. By HEWETT C. WATSON, Esq., F.L.S.

(Continued from p. 147).

IN my former remarks on this subject, I left, for a separate communication, the "crucial" inquiry about any facts directly in proof of a transition of species, one into or from another. Theoretically, a species comprehends all the individual plants which are descendants (or might have been descendants) from a single progenitor, how wide soever their differences may have become in course of many descents. Practically, this idea of a species is utterly disregarded by the botanists who describe and give names to plants; scarce any of them ever trying a single experiment, in order to ascertain whether species A can or cannot be raised from the seed of species B. With botanists the practical inquiry is merely a search for some one or more physical characters, usually those of shape or proportion, sufficiently obvious to be readily seen in dried specimens, and sufficiently uniform to become marks whereby to distinguish the plants. If such characters can be found, the plants are described as distinct species; and this is done, even although only "a single specimen, and that none of the best," has been seen by the describer. That potent organ in the brain, called by phrenologists the "Love-of-Approbation," or (better name) "Love-of-Notoriety," stimulates many of our botanists to seek out even the most trifling differences, upon which to found a pretence for "making a new species," and giving it a name. This circumstance, together with the frequent change-naming and cross-naming of plants, has rendered it customary of late, to add also the surname of the botanist who first applied to any plant the technical name by which it is designated. This addition of the botanist's own name should have removed much of the uncertainty occasioned by changes and misapplications of names of plants. Unfortunately, by giving a powerful stimulus to the Love-of-Notoriety organ, the custom has tended greatly to increase the confusion and uncertainty of plant-nomenclature.

The consequence now is, that we have many gradations of species—so to speak. Some species are universally admitted distinct by all botanical authorities; as *Betula alba* and *Betula nana*. Other species are received as such by the majority, though questioned by some few; as *Primula veris* and *Primula vulgaris*. With regard to others, opinions may be held equally balanced or thereabouts; as *Ranuncu-*

lus aquatilis and Ranunculus circinatus. Many more are deemed varieties by the majority, while the minority (one, two, three, or more) describe them to be species; as Alchemilla alpina and Alchemilla conjuncta.

The step from those plants which are allowed by all to be simply varieties, into others which only very few botanists (perhaps only a single botanist) suppose to be distinct species, must be a very small step indeed. And once among these dubious species, we may ascend, step by step, from the least to the most generally admitted. A single step more, and we arrive at the universally admitted species. At which, of all these little steps, are we to find the impassable barrier between varieties and species? Where does the possibility of transition cease, and the impossibility succeed?

Notwithstanding a mere theoretical definition, never really applied by way of test to one species in a thousand, the assumed difference between species and varieties, the capability or incapability of transition, is simply conjectural—an unproved idea of the mind—a *petitio principii*. The assumption is so far a safe one, that it never can be disproved, never can be put to a test which would be conceded by its believers. Could any one raise a beech tree from the acorn of an oak, the botanists might fall back on their theoretical definition, and argue that the fact only proved the beech and oak to be varieties of one single species. While the transitionist, on the other hand, would feel himself entitled to put forward the fact as a confirmation of his views; namely, that one species could give origin to another different species.

No doubt so wide a transition as that of an oak into a beech, were it possible, would shake the faith even of the most unreasoning botanist. But it is equally an arbitrary assumption on the part of botanists, to say that a cowslip and primrose are proved varieties of a single species, if one can be raised from the seeds of the other. The distinction is one of degree only; the oak and beech being more dissimilar, the cowslip and primrose less dissimilar.

Still, the tendency of like to produce like, is so evident and decided throughout the best understood operations of Nature, that botanists may reasonably call on the transitionist to prove, if he can, that the exceptions to this tendency may extend so far as species. On the other side, the transitionist may plead that he should not be required to show cases of change between very dissimilar species; but that he creates a presumption in favour of his views, when he adduces instances of transition in plants which are held to be distinct species by botanists of acknowledged skill and reputation.

I must now become, temporarily, a sort of advocate for the transitionist, in adducing some examples which look very like cases of transition. Assuredly I can bring none so wide as the alleged conversion of the rye into the oat; which, I may safely assert, is credited by extremely few botanists. But facts of minor conversion are not altogether wanting; and if more diligently looked for, they might be found more numerous than is at present supposed to be the case.

Viola canina (Linn.) and *Viola flavicornis* (Smith). — The dog's violet is the commonest species of its genus in Britain. Being found under very different conditions of soil, shelter, humidity, &c., it runs into several varieties; so that the line between this one and allied species (so reputed) is drawn differently by botanical authorities. One of these (species or varieties, as opinions may run) is the *Viola flavicornis* of Smith—not the dwarf variety figured under this latter name in 'English Botany' (2736); but the one described in 'English Flora,' and specimens of which are preserved in Smith's herbarium. The *V. flavicornis* grows on open commons, and it presents several differences of physical character, when compared with the ordinary forms of *V. canina* which are seen in coppices and hedge-rows. The differences are not very strong, yet are quite as wide as those which are deemed sufficient to distinguish species in the same genus, or those in other genera. It has been stated, also, that these peculiarities remain unchanged in living specimens after removal into a garden. I have not found this stated fact to hold true with a plant brought into my own garden. An example of *V. flavicornis* was removed from a common in Surrey, into my garden, when flowering, in 1841. Being absent in the summer of 1842, I did not see it during that season; but in 1843 and 1844, it had assumed so much the size and shape of leaf, with other peculiarities which belong to *V. canina*, as to be barely (if at all) distinguishable from some forms of the latter, when pressed and dried. Moreover, I have raised plants in a flower-pot, from the seeds of a wild example of *V. flavicornis*, which came still nearer to the more usual form of *V. canina* than did the changed garden plant. In neither case, has the typical form of *V. canina* been fully acquired — perhaps, it was not to be expected so rapidly; but together with a series of wild specimens in my herbarium, they suffice as links of connexion between the two reputed species.

Polygonum maritimum (Linn.) and *Polygonum Raii* (Bab.) — The plant which is now becoming familiar under the name of *Polygonum Raii*, has been imperfectly known to the botanists of England for many years. About the year 1831, when a very young botanist, I was

struck by the difference between this plant and *P. aviculare*, with which it had previously been associated; but the specimens then sent to the author of the 'British Flora,' were placed as a variety of *P. aviculare*, in the second or third edition of that work. In the fifth edition, it appears as a distinct species, under the name of *P. Roberti*; but the identity of our plant with the *P. Roberti* of the continent being doubtful, Mr. Babington has described it under the name of *P. Raii*. I am not aware that any botanical author has yet concurred with me in deeming it rather a variety of *P. maritimum*, than of *P. aviculare*. Those who do not believe it a variety of *P. aviculare*, hold it a proper species. *P. Raii* is technically distinguished by the few and unbranched nerves of its short ochreae, the long internodes, loosely trailing habit and annual root. In *P. maritimum* the ochreae are longer, with more numerous and branching nerves, the internodes very short, the root perennial, and the plant forming a suberect close bush. Yet the seeds of the true *P. maritimum*, collected in the Azores and sown in my garden, produced plants in 1843, which partook much of the physical characters of *P. Raii* from the shores of Britain. They had the loosely trailing growth and long internodes of *P. Raii*, though nearer to *P. maritimum* in their ochreae; and they proved annual in this climate. Other examples, raised from the seeds ripened in 1843, had rather reverted back again towards *P. maritimum* in the drier and warmer summer of 1844; having their ochreae larger, internodes shorter, and leaves broader and more coriaceous, than was the case in the examples of 1843. Further experiments will require to be made on these plants; but I may mention one circumstance which will show that the general appearance of my garden plants, of 1843, approximated to that of the British *P. Raii*. One specimen was sent by post to a well-known Professor of Botany, who has collected *P. Raii* in its native localities, with a request that he would name the specimen. His reply was "*P. Raii*." I wish that some kind botanist would send me ripe seeds of *P. Raii*, for a trial how near this could be brought to *P. maritimum*.

Lolium perenne (Linn.) and *Lolium multiflorum* (Lam.) — English agriculturists have latterly been sowing the *Lolium multiflorum*, which they call "Italian Ryegrass," instead of the better known *L. perenne* of Britain. That there is some decided difference between the two species, and that this difference is perpetuated by seed, may be inferred from the preference shown for the Italian ryegrass. The most conspicuous distinction between them, botanically speaking, occurs in the awned paleae of *L. multiflorum*. Besides this, the spikelets are

composed of more numerous flowers, whence the specific name; and the plant is usually of a paler colour and more upright growth. It has been stated, as a further distinction, that the *L. multiflorum* is annual, producing no "barren shoots." On examining this grass in sown fields, I have found a very large proportion of the plants corresponding with the alleged characters of the species; but I have also found among them examples in exception to each one of the distinctive characters in turn; some having the awns very small or obsolete; some having fewer flowers in the spikelets than *L. perenne*; some producing barren shoots, &c. About Midsummer, 1843, I transplanted a root from a sown field of *L. multiflorum*, into a small flower-pot; cutting down the flower-stems, and supplying the plant rather sparingly with water. It grew rapidly, soon filled the flower-pot with its roots, and again produced flowering-stems in September and October. The flowers were now less numerous than usual in the spikelets of *L. perenne*, and were scarcely awned at all. This same plant lived through the winter in the flower-pot, and was transplanted into the open ground in spring. In the summer of 1844, it grew into a strong tuft, producing many flowering-stems, with numerous flowers in the spikelets, bearing very short awns; also many barren shoots; the colour of the whole plant being equally deep green as that of *L. perenne*. It was scarcely distinguishable from *L. perenne*, except by its short awns—if this can be deemed a distinction, for *L. perenne* is occasionally awned in Britain. My observations and experiments upon this grass were intended to try the constancy of its distinctive characters; and thus the case is left short of full transition, although the changes went so far as to give a strong presumption in favour of the possibility of transition.

Primula veris (Linn.) and *Primula vulgaris* (Huds.)—In my second paper on the present subject, I cited some examples of two reputed species being so connected by intermediate varieties, as to cause difficulty in tracing any clear line of distinction between them. One of these examples was found in the cowslip and primrose, which are closely connected by intermediate varieties, usually called oxlips. These varieties occur under such circumstances as create a presumption that they are the offspring of one or both of the two species mentioned. I have lately proved by direct experiment, that the seeds of an oxlip, all taken from the same plant, at the same time, and sown together, will produce a mingled assemblage of cowslips, oxlips and primroses; the oxlips forming a series of intermediate forms, passing into the cowslips at one extremity of the series, and into the primroses at the

other extremity. I hope shortly to publish a detailed account of this experiment, and shall therefore not give more exact particulars here. I had expected to obtain primroses and oxlips, but had not anticipated the occurrence of cowslips also. It is true, the recorded experiments of Herbert and Henslow might have led me to expect the result which appeared; but I may now confess a lurking suspicion that some unascertained cause of error had been at work in their experiments. And since Hooker, Babington, and other botanists still continued to describe the cowslip and primrose as two distinct species, I may presume that they were also sceptical on the point. Now I can see only a choice between two inferences; namely, that the cowslip and primrose are a single species only, or, that one species can pass into the other in two descents—the oxlip being the intermediate step. The experiments of Herbert and Henslow show the cowslip passing into the primrose in one descent.

Festuca pratensis (Huds.) and *Festuca loliacea* (Huds.) — For half a century past, it has been customary with British botanists, to describe the *Festuca pratensis* and *F. loliacea* as two distinct species. The difference between them has appeared so strong in the eyes of some botanists, as to warrant them in placing *F. loliacea* under another genus (*Brachypodium*). In Steudel's *Nomenclator*, which bears the date of 1841, they are entered as distinct species; as also in the Catalogue published the same year for the Botanical Society of Edinburgh. I had, however, seen some evidences that one could change into the other, before the Edinburgh Catalogue was published; and in the same year of 1841, I brought a wild root of *F. loliacea* into my garden. Though planted in close unworked soil, it had become a large tuft by 1843, and in the summer of that year it produced numerous flowering stems. Some of the stems retained almost exactly the character ("spiked raceme") which distinguishes the wild *F. loliacea*; while others of them had so far assumed the branched or paniced inflorescence of *F. pratensis*, that a botanist would assuredly have assigned them to *F. pratensis*, unless informed that they had been taken from a root of *F. loliacea*, or shown the intermediate forms, which were also produced from the same root. A root of *F. pratensis*, removed into the same garden, became in 1843 rather less like *F. loliacea*, than it was in its wild state; but in the dry summer of 1844, some of its panicles were reduced nearly into racemes. I have also seen these two reputed species pretty closely connected in a series of wild specimens, collected by Mr. Tatham, in the neighbourhood of Settle. In this case, *F. loliacea* appears to become *F. pratensis* simply by

increased luxuriance, which is favoured by the free space allowed to it in the garden.

Tolpis umbellata (*Bert.*) and *Tolpis crinita* (*Lowe*).—Those characters which are sufficient to warrant the assignment of plants to two different genera, should be of a more important kind than are the characters which suffice only to distinguish two species of the same genus. In the *Prodromus* of DeCandolle, the *Tolpis umbellata* and *T. crinita*, though brought under the same genus, are assigned to different sections of their genus. These sections represent the genera of other authors, *Drepania* and *Schmidtia*, founded on differences in the pappus of the fruit, akin to those which separate *Thrinchia* from *Leontodon*. In the year 1842, I collected specimens and seeds of *Tolpis crinita* in the Azores. The specimens corresponded with one from Madeira, which was given to me under the same name by Dr. C. Lemmann, who has enjoyed the best opportunities for becoming well acquainted with Mr. Lowe's plants. The seeds were sown in my garden, and produced plants which I could refer only to *T. umbellata*. I communicated one of these living examples to Dr. Lemmann, and he wrote me that the plant was *T. umbellata*; thus corroborating my own view of them, and showing that *Tolpis* (*Drepania*) *umbellata* and *Tolpis* (*Schmidtia*) *crinita* are not permanently distinct species — much less distinct genera. This instance, if so explained, may be considered a case of unnecessary "hair-splitting" in the formation of genera. Or, on the other side, the transitionist may argue that characters which have been deemed sufficient to separate genera, may be acquired and lost in such manner as should throw doubt on the supposed impassable distinctions of species.

Orchidaceous genera. — Mr. Schomburgk published a paper in the *Linnean Transactions*, to show that orchidaceous epiphytes, referred to three different genera by first-rate authorities in this order, could change into or produce one another. One of the plants "produced a scape with six flowers of *Monachanthus viridis* and two of the *Myanthus barbatus*, while a second scape of the same bulb had twenty-five blossoms of the *Myanthus barbatus*." The same combination of genera occurred on a second plant in another collection. A third plant produced the flowers of *Monachanthus viridis* at one period, and those of *Catasetum tridentatum* at another time. And on Mr. Bach sowing the seeds of *Monachanthus viridis*, one among the plants produced a scape with the flowers of *Catasetum tridentatum*. Here, also, it may be said that the plants had been incorrectly described as different species and genera. But the fact still shows that cases of tran-

sition can occur, where the differences were so wide that a first-rate botanical authority deemed the plants to be not only specifically, but even generically, distinct. In fact, nothing less than the actually observed transition would have caused botanists to unite the three into one species.

Among the cellular plants there are instances alleged, which, if correct, would establish the possibility of transition from one order to another. Perhaps, not much stress should be laid on these instances at present. I do not know that stronger examples than the preceding can be adduced from the vascular plants. Their tendency is in favour of the theory of transition; although, from admitting of a different explanation in each example, they do not yield unquestionable evidence in support of that theory.

I will not write more on the subject just now; though it may perhaps be desirable to add two or three pages more, on a future occasion, for a short summary of the leading arguments, on both sides of the question. I have curtailed argument as much as possible, under the idea that the reasoning faculties are so poorly developed in botanists (as a class—but with exceptions) that very few of them will feel any interest, or see any importance, in such an inquiry. The idea of its bearing in any way on the moral condition of the human race, will doubtless appear ridiculous before the eyes of nineteen in twenty botanists. But slender as may be his knowledge of plants, the author of the 'Vestiges' can see much farther than this into Nature and Nature's laws.

HEWETT C. WATSON.

Thames Ditton, May, 1345.

Note on Luzula congesta, (Smith). By THOMAS BENTALL, Esq.

MR. BABINGTON, contrary to the opinion entertained by some other botanists, still considers this to be a distinct species; and describes it in his Manual under the name of *Luzula multiflora*, (*Lej.*) The characters by which Mr. B. distinguishes it from *L. campestris*, are the greater comparative length of the filaments, and the oblong (not reniform) seeds. The following remark is appended to the description:—"I introduce this as a species, in order to draw attention to the character which appears to distinguish it from *L. campestris*, that its constancy may be ascertained." It appears to me that there has been some misunderstanding connected with these plants. In the 'British Flora' it is stated that both grow together, which I believe is rarely the case, as *L. campestris* abounds most in open meadows and

pastures, whilst *L. congesta* prefers woods and shady places, and has always seemed to me to preserve a very distinct appearance. Perhaps some of the readers of the 'Phytologist' may feel inclined to examine them minutely during the present season, and will communicate some information respecting them. The seeds will probably be found to afford a good distinguishing character; should they be desiderata with any of your readers, I should feel very happy in supplying them.

THOMAS BENTALL.

Halstead, Essex, April 4, 1845.

Note on Equisetum hyemale. By J. B. BRICHAN, Esq.

YOU will remember that in my first paper regarding *Equisetum hyemale* &c. (Phytol. i. 374), I mentioned the existence of a "pile of cones," which I found on the top of the stems. Subsequent observation has led me to the following conclusions. A young stem, of about half an inch in height, consisting apparently of *one* sheath, contains, as you are aware, the *embryos* of all the sheaths which compose the full-grown stem. In this stage it exhibits a conical termination, which is composed of the black appendages termed *teeth* united into one. As the *second* sheath rises out of the first, it carries with it this *cone*, into which, of course, its own teeth, coalescing in a similar manner, are inserted. And thus each sheath, as it emerges from its *envelope*, carries atop the matured and withered and conically united teeth of all that have grown before it, until at last the "pile of cones" appears on the top of the full-grown stem, and either falls off before the catkin appears, or is by it cast down from its somewhat singular eminence. These remarks are confirmed by the fact, that the uppermost cone is the largest, and that the cones decrease in size as they approach the apex of the stem. The *rationale*, if I may be allowed the expression, of this curious elevating process, I must leave to be explained by more able botanists. I am satisfied that the account I give of it is correct: and I think it goes far to prove that *Equisetum hyemale* at least is distinct from *E. Mackaii* and *variegatum* as a species.

J. B. BRICHAN.

Aberdeen, April 9, 1845.

The true signification of the term "recurvus."

By HEWETT C. WATSON, Esq., F.L.S.

WITH due deference to the able individuals whose opinions on this word are recorded in the 'Phytologist,' I would suggest that all of them are correct, although too limited in their definitions of the term "recurvus." The value of the prefix "*re*" may be expressed tolerably well by the words "back" and "again," when used in the sense of a change from the actual course of things to one which is contrary thereto. In passive objects (as distinguished from events) a change from the *usual* state or direction seems to be implied by the use of *re*. It may thus signify "upwards," "downwards," "outwards," or "backwards," whichever of these is contrary to the usual direction.

Some examples may make this more clear. A curve in the bill of birds usually brings the tip downwards; but the upward bend in the bill of the avocet, being in the contrary direction, is expressed by calling it "recurved." The antennæ of insects usually extend forwards from the head; but if so curved that the direction of the tip is reversed and turned backwards, they are called "recurved." The leaves of plants usually ascend from the bases by which they are attached to a stem; but when this direction is so far reversed that the tips of the leaves point downwards, they are said to be "recurved" or reflexed. In ferns, there is usually some convexity of the upper surface, the edges of the frond bending downwards; but if the direction of the edges becomes reversed and turned upwards, which is contrary to the usual direction, the term "recurved" will here correctly express the change.

By a larger definition of the term "recurvus," so as to include any direction contrary to the usual or principal direction, it will take in all the special examples, whether their curves are upwards, downwards, outwards or backwards.

The name "concava" really appears less aptly given to Mr. Bree's fern; since it does not necessarily imply a concavity of the upper surface. A hat and a wine-glass are each concave, though the concavity is upwards in one, downwards in the other; but the brim of an English hat, as well as that of a champagne-glass, is recurved, because it is bent in a direction contrary to the principal and usual concavity of hats and wine-glasses.

HEWETT C. WATSON.

Thames Ditton, April, 1846.

On the duration of Rubus discolor. By THOMAS MEEHAN, Esq.

IN Dr. Salter's 'Observations on the Genus Rubus,' inserted in the March number (Phytol. ii. 87), I observe that considerable uncertainty exists in the botanical world respecting the age to which the shoots of these plants attain. The general opinion seems to be, that they are biennial; but, as Dr. Salter observes, some of them live for a much longer period. There is growing in a hedge-bank adjoining a wood at St. Clare, a plant of *Rubus discolor*; the main stem of which, to my knowledge, is seven years old: it may possibly be older, but I have observed there for that time. It is above three inches in circumference, and at about four feet from the ground branches out into a large head, which, being entangled in that of an adjacent willow, is supported by it. There is a quantity of dead *biennial* wood, but of no other age, among the rest, which seems to me to afford good ground for a conjecture, that if the wood live above two years, it will live for an indefinite period. The *tree* is otherwise healthy, and budding well.

THOMAS MEEHAN.

St. Clare, near Ryde,
April 25, 1845.

Remarks on Calamintha sylvatica, (Bromfield).

By T. BELL SALTER, M.D., F.L.S.

HAVING now for nearly two years observed with much interest and some little attention that most remarkable and truly beautiful addition to our Flora, which was made by my friend Dr. Bromfield, in August, 1843, by the discovery in this island of the *Calamintha sylvatica*, notices of which have appeared in former numbers of the 'Phytologist,' I am myself induced to offer a few remarks on the same plant. The last account given by Dr. Bromfield, in the February number (Phytol. ii. 49) was so extremely clear, that it would appear to leave little to be said on the same subject. The opinion of many of the most eminent botanists in the country, who received early specimens of the plant, that it was only a variety of *Calamintha officinalis*, produced by growing in shady situations, was at first so decidedly and strongly held by them, that I cannot but think that the testimony of one who has watched it attentively in its native wood, for both two flowering and two springing seasons, may be of some interest. Added to this, however, I am able to give some account of its behaviour under cul-

tivation, and what is more decisive, under precisely similar circumstances with its ally, *C. officinalis*. I shall confine my remarks to what I have myself observed; and it will be seen that my observations are entirely in confirmation of the opinions expressed by my friend its discoverer. A single glance at the plant growing in its natural habitat, would satisfy any observer of its distinctness from *C. officinalis*; and it is worthy of remark, that *all* who were able to visit the station, held this opinion from the first, while *all* the eminent botanists to whom dried specimens were sent, came to the contrary conclusion. Different as are the habits of the two species, it appeared difficult at first to find distinctive characters between them, such as should be explicit and easily recognized from description. These, however, have been subsequently detected, and are perfectly sufficient to mark the specific distinctness of the two plants. Dr. Bromfield (Phytol. ii. 51) mentions the circumstance of my having pointed out to him one of these characters, namely, the difference of the roots in respect to creeping stolons; and in their habits in this particular will be found the principal difference between the two plants, which is available for *descriptive distinction*:—the characters on this point being absolute, whereas, the others, striking as they appear when the plants are viewed together, are yet only comparative. Dr. Bromfield, in his excellent and elaborate description, does not, however, in giving the habit of the root of *his* species, describe its peculiarity quite to its full extent. He speaks of its “sending out one or more underground runners or stolons,” whereas, in fact, it sends them out very numerous, and sometimes literally by dozens.

Presuming that the mode of growth of the common calamint (*C. officinalis*), which is truly suffrutescent, the lower part of the stem being woody and persistent, and throwing out each spring new upper shoots, but never producing stolons,—presuming that the habit of this, the common species is generally known, I shall only proceed to detail the mode of growth in the new species.

In *Calamintha sylvatica* may be detected, at the time of flowering, numerous stolons, some running underground, and some visible above, and a few low trailing branches. After the inflorescence has passed, these *low trailing branches* continue to grow in an ascending form, and finally terminate, in the early winter, with a little tuft of folded leaves or false bracteas, such as those which may be so frequently seen in the autumn in *Glechoma* and some of our perennial species of *Veronica*. The mode of growth above described, will be allowed to be very different from that of *C. officinalis*.

During the winter the ascending shoots perish, together with a considerable portion of the stolons; the latter probably in proportion to the amount of protection which the plant may happen to receive, and the severity of the winter, but as far as I have yet observed, the greater portion of the plant which is above ground perishes. In the early spring the underground stolons begin to shoot, and the young plants sprout up all around the former stems, — some of them at a distance of many inches, sometimes as many as six; but the base of the old stem has not the slightest remaining vitality. I have planted in my garden both species, and under similar circumstances they both preserve their characters and habits, the only difference I observe being that with *C. sylvatica*, when growing in bare mould, where the protection of moss, leaves and dead twigs is wanting, which is so abundant in its native copse, not only nearly, but quite the whole of the superficial stolons perish in the winter.

This plant is so ornamental, that it appears fully desirable to adopt it in cultivation. The difficulty of succeeding in the cultivation of some of our native plants, which yet grow freely and abundantly in their natural condition, is sometimes so great, that perhaps some account of my first attempt with the plant, the subject of these remarks, may be worth recording, particularly as some of the consequent changes are rather interesting. Young plants spring so numerously from the stolons, that they may be readily multiplied by merely dividing them: in addition to this, any early top or branch may be readily rooted, and seedlings also spring up abundantly around the old plant, so that it is most easily propagated. If any of the young plants be placed in a shaded part of a garden, they retain the characters natural to the wild plant; but in altered circumstances they undergo considerable modifications — yet not such as influence the essential habits and characters of the plants. The results of altered circumstances of two kinds I have noticed, and shall proceed to detail.

If placed in a sunny border, the whole plant is much shorter, the inflorescence bears a larger proportion to the foliage, while the individual flowers acquire a much deeper tint. The plant however loses much of its elegance, assumes an unhealthy appearance, and its duration is very much diminished. These effects are probably due to an increase of both light and evaporation. When, however, it is subjected to an increased abundance of light, but without a greater degree of evaporation, as, for instance, under glass, where it will most readily grow in a pot of rich mould, the effect is very remarkable. Under these circumstances it becomes a most ornamental plant, —

retaining the full vigour of health, while the inflorescence is immensely increased, and a succession of flowers is constantly reproduced from the same verticillaster for a period of six weeks. The number of flowers thus produced on one plant, is truly immense. As a plant for the greenhouse, it is well worth the notice of floriculturists.

To those readers of the 'Phytologist' who may be residing in London, or visiting the metropolis, it may be well to mention an opportunity of seeing this plant growing under circumstances which, *a priori*, I should conclude would very little change its habits. My friend, Mr. Edward Newman, has had fitted up a *Ward's case* at the Phytologist Office in Devonshire-street, for the purpose of keeping a set of ferns for reference and authentication; and he has also introduced into this select company a few phanerogamous plants of interest, — our *Calamintha* amongst the number: thus giving botanists a convenient opportunity of witnessing, in a growing state, plants which otherwise many would be unable to see, except as dried specimens. I feel that we are much indebted to Mr. Newman for this new boon, added to the many we have already received from the truly scientific discovery of my valued friend, the inventor of the glazed cases.

T. BELL SALTER.

Ryde, May, 1846.

Comments on some Observations by Dr. Bell Salter, on the Genus Rubus. By EDWIN LEES, Esq., F.L.S., &c.

I AM disposed to hail with pleasure every fellow-labourer in the thorny thicket, and have perused Dr. Bell Salter's observations on our *Rubi* with much interest; and for the trouble he has taken to make out the Selborne species, by communication with eminent botanists, and his examination of the works of preceding observers, much credit is certainly due to him. I should not therefore have responded on the present occasion, having rather a disinclination for controversy, which too often becomes as prickly as the bramble itself, had not the Doctor brought me out so prominently in his paper — first in *agreement* and lastly in *discordance* with my ideas, on which he has descanted freely, which he had a perfect right to do. But this renders it absolutely necessary for me to explain one or two points, that seem to require elucidation; the rest I leave to another occasion, when I can enter more fully on the subject.

In the remarks I am about to make, I have not the slightest wish

to do otherwise than honour Dr. Bell Salter's powers of discrimination; but I must say this, that no "three days" nor even three years' observation of dried Rubi in herbaria, are sufficient to enable any person to speak with absolute confidence in doubtful or difficult cases, as to the specific distinctions of the fruticose brambles, who has not likewise for *many* years narrowly watched them *in a growing state*. This is a hard saying for railroad botanists, I confess, but in my own case, I will candidly say, *probatum est*. I have myself carefully regarded the subject for ten years, and am on some points doubtful even now.

Dr. B. Salter has very handsomely expressed his general agreement from his own experience with my exhibition of the mode of growth of the British fruticose Rubi, contained in my paper in the 'Transactions of the Edinburgh Botanical Society,' but "takes the most decided exception" to the modification which habit exercises upon apparent specific character. The Doctor has however altogether omitted to say what characters he considers *unchangeable*, and what are variable. Now this is a point of the utmost importance in the enquiry, and on this everything hinges. I fear it would take up too much space to go fully into the subject on the present occasion, but this, at least, my experience fully warrants me in affirming, that the *glandulosity* of the panicle is not to be depended upon as an unalterable specific character in the Rubi. Hence, strange as it may appear to Dr. B. Salter, *R. radula* may present itself *without a gland*, and *R. suberectus* exhibit abundance of them, contrary as this is to their character generally. Indeed, I can state confidently, that I have traced *R. cæsius* on the one hand from being moderately glandular, to a state profusely so, and on the other, to a variety where not a gland can be seen, even with a lens. So in the form I have called *R. sublustris*,* (equivalent to Smith's *R. corylifolius*, and Leighton's "second form of *R. rhamnifolius*"), where in a full sunny exposure abundant glands are induced on the panicle, peduncles and calyces, while in the shade the pubescence smothers and entirely obliterates the glands. Even the barren stem is thus affected, the exclusion of light often preventing the appearance of setæ and glands, which a bright sun and powerful temperature would call forth. This fact should hint caution to the namers of dried specimens, and indeed collectors should be precise in stating whether their specimens were gathered in a sunny exposure or in the shade.

* This is substantially the same form as that I called *R. cænopus* in the Edinburgh Transactions, the name seeming more appropriate.

Dr. Salter objects to my speaking of *R. dumetorum* as growing *erect*, but I meant relatively to the usually creeping *R. cæsius*, and had perhaps better have written *assurgent*. True enough, Weihe and Nees say technically, "caule procumbente;" but these literal unaccommodating definitions perpetually mislead. The stem would of course arch, trail, and root, *if it could*; but, imprisoned in a stout hedge, it is impelled upwards, and cannot do so, and the very name, *dumetorum*, shows the idea of the plant raised from the ground and supported among bushes, which is usually the case — if a shoot escapes, it of course arches and becomes decumbent. In alluding, then, to the "erect *dumetorum*," I refer to the plant as kept from being procumbent by circumstances; and unquestionably, observation generally shows it to be *supported*, and thus it will flower at the top of the very highest hedge. Very well, then, my deduction is this, made from hundreds of cases, that however *convenient* it is (and I admit it is so) to separate *dumetorum* from *cæsius*, still that the former is really a metamorphosis of the latter, the flowers being larger and more specious, while the fruit is never so fine as in *cæsius*, and is indeed mostly abortive. In fact, between *cæsius*, laid low in a ditch, and *dumetorum*, elevated *in excelsis*, every possible variation may and does occur; and I have gathered specimens so nearly midway between them, that they were appropriable by either or both.*

But there is some error, Dr. B. Salter thinks, in my deriving the *R. diversifolius* of Dr. Lindley also from *cæsius*; — let us see. The old proverb says that "it is a wise son that knows his own father," and in Botany I shall be inclined to think in future, that it must be a wise father that knows his own son! It is easy and pleasant enough to *name* a plant, but not so easy, perhaps, to know it again afterwards: this difficulty, I trust, will not ever accrue to Dr. Salter, with regard to his *R. Babingtonii*. We are at issue about the glandulosity of *R. diversifolius*, and the Doctor wings me with an arrow from *Mr. Borrer's* quiver! But with every respect to Mr. Borrer, surely the authority to be relied on in *this* case, for a correct decision, must be *Dr. Lindley*. Now, some years ago, when I was young in the study of Rubi, and with fewer thorns in my side than at present, making, I confess, but little progress with Lindley's ingenious but tantalizing

* Dr. Salter's "decided exception" to this view of the case, seems rather strange, since Sir W. J. Hooker originally made the *dumetorum* of W. and N. the β . *cæsius* of his Flora; and the discriminating editor of the new edition of 'English Botany,' says that "*R. dumetorum*, *W. et N.*, is either a luxuriant variety of *cæsius*, or as suggested by Lindley, synonymous with *R. corylifolius*, *Smith*."

Synopsis, my friend, Mr. W. Allport Leighton, of Shrewsbury, the acute author of the elaborate 'Flora of Shropshire,' who was himself then hardly out of the labyrinth, liberally supplied me with duplicates of all the species *Dr. Lindley had, himself, very kindly named for him*; and this courtesy of my friend's I ought the more gratefully to acknowledge, as it fairly set me up in the blackberry business, in which I have since embarked to some extent, though not without staining my fingers, and, for aught I know, ultimately leading me, as Dr. Salter seems inclined to think, into ruinous speculations! However, among the suite of named Rubi thus obligingly forwarded me by Mr. Leighton, was "*R. diversifolius*," thus absolutely from the very fingers and observation of Dr. Lindley himself. This specimen I still possess; and both the barren stem and panicle are *abundantly* clothed with glands, and the former with setæ. But to go further than my specimen, and prove decidedly that *R. diversifolius* is glandular, and was actually understood to be so both by Leighton and Lindley, I need only refer to the 'Flora of Shropshire,' which is not alluded to in the matter by Dr. B. Salter. Here, under *R. dumetorum*, whose *abundant glandulosity* none will dispute, it is distinctly stated: "Specimens of this plant, *submitted to Professor Lindley*, were pronounced by him to be his *R. diversifolius*. Of similar specimens, Mr. Borrer says—'*R. dumetorum*, *W. & N.*: I incline to refer it to *R. corylifolius*, *Sm.*, although, in some respects, it is more like *R. cæsius*.'"* Will any one be surprised, if, with these opinions, and under these circumstances—having traced *R. dumetorum* as a derivative from *cæsius*—I should come to the same conclusion with *R. diversifolius*, represented by Leighton, and thus tacitly admitted even by Mr. Borrer to be the same plant. For, in the following paragraph, after stating that he had sent similar specimens, though from a different locality, to Nees von Esenbeck, who had named them *R. dumetorum*, *β. &c.*, Mr. Leighton goes on to say that from the latter locality, specimens were forwarded to Mr. Borrer with Esenbeck's remarks; and "he also (that is Mr. Borrer) concurs in naming them *R. dumetorum*, *W. & N.*, and *identifies them with specimens marked by Lindley R. diversifolius*, *Lind.*!" Now, what can be possibly plainer than this? As to the solitary specimen in Mr. Borrer's herbarium, which it appears is non-glandular, and which is rather cautiously said to be "*as from the authentic bush, &c.*," † as if it was not absolutely *certain*, although taken from *some* bush in

* Leighton's 'Flora of Shropshire,' p. 238.

† Leighton, *Ibid.*

the Chiswick Garden, I cannot, of course, unravel its history, nor was I called upon to do it. There was no difficulty apparent in *my* path; but, surely, Dr. Bell Salter—seeing the discrepancy between himself and me as to the glandulosity of *R. diversifolius*, and seeing too, what Leighton has said on the subject, as I have quoted above, where Dr. Lindley himself is made to concur with *dumetorum* and *diversifolius* presenting no marks of difference from each other—really, I think when Dr. B. Salter saw the aspect of the specimen, “*as from the authentic bush*,” &c., before he founded any argument upon it as against me, he was bound to clear up the mystery there is in the affair. For the fact is apparent, that either Dr. Lindley has mistaken his own plant, which I can scarcely conceive, its original character has been altered by cultivation, or Mr. Borrer’s specimen is *not* “*from the authentic bush*.” This latter may be, indeed, for aught I know to the contrary, *R. vestitus*, (*W. & N.*) and yet not the true *R. diversifolius*, (*Lind.*) On this point I shall not dilate, because I have not seen the specimens Dr. Salter terms *R. vestitus*, and which clearly are not the same I have had in view as *R. diversifolius*, (*Lind.*) * But, after all, just to show how little a *single* specimen ought to be trusted, even from an “*authentic bush*,” and how varying and perplexing the glandulose brambles especially are, I may mention that the year before last I received a packet of Rubi to examine, which had been gathered in Leicestershire by the Rev. A. Bloxam. A set of specimens, all collected at the same time and place, and from the same bush, in admirable order, were ticketed *R. Koshleri*? var. On comparison, the panicles approached very closely in character to—if not absolutely identical with—*R. Leightoni* of Flor. Shrops.; but out of four, two were *copiously glandular*: in one the pubescence had overpowered the glands, and in the other no glands were discernible, even with a powerful lens! Dr. Salter, I ought to say, observes *absolutely* of the specimen of Mr. Borrer he states to be *R. vestitus*, (*W. & N.*) “*which he had from Dr. Lindley’s own plant in the Horticultural Gardens*,” but Mr. Borrer himself, in Leighton, only says that he received it “*as from the au-*

* Is there any botanist resident in London, sufficiently interested about the point in dispute, or who will act as umpire, just to see if any specimens “*from the authentic bush*” of *R. diversifolius* are in the Linnean or Botanical Society’s collections, and report thereon; or if not, why not make a dash at “*the authentic bush*” itself in the Chiswick Garden? The thoughtful bystander may, perhaps, be tempted to answer with Gammon, in ‘*Ten Thousand a Year*,’—“*He’d let me scratch my hands in getting the blackberries, and then he’d come smiling in to eat ’em.*”

thentic bush," &c., but from or by whom no mention is made. However this may be, or with whomsoever any mistake in the matter may rest, with a *glandulose* specimen of *R. diversifolius* before me, named by the original describer, and authenticated in Leighton's 'Flora,' I trust to be exonerated from being the propounder of error so far, and it remains to be seen if *R. diversifolius* and *R. dumetorum* be the same they were when Mr. Leighton's 'Flora' was published in 1840.

Having, then, disposed of two of the points excepted to by Dr. B. Salter, I come to the third, on which, he says, he is "equally sceptical." Observation can alone decide here, but it must be the observation of years. My remarks had reference to Smith's *R. corylifolius*,* to which, seeing the necessity of altering a name so prone to deceive, I had at first thought to give the appellation of *cænosus*, but afterwards substituted *sublustris* as more applicable, from its usually large and often specious flowers, and under this name it appears in the Catalogue of Plants published by the London Botanical Society. When I commenced my enquiries, I had some difficulty in procuring a true specimen of *R. corylifolius*, (*Linn.*); but having at last received numerous brambles sent me from the Botanical Society, as well as from correspondents in various counties, the *corylifolii* soon swarmed about me, "thick as leaves in Vallambrosa," proving rather too numerous and unmanageable, so that I was actually obliged to billet them off through the whole series of forms from *suberectus* to *cæsius*. I found, at last, that there was a form *very nearly allied to R. cæsius*, as truly stated by the editor of the 2nd. edit. of 'English Botany,' "being a much stouter plant in its general form, less humble in growth, the stems being rather arched than prostrate, with stronger and more uniform prickles and setæ," † which technically could not be referred to *R. cæsius*, and which was very different from *R. dumetorum*, (*W. & N.*) This form I found to be exceedingly variable, sometimes glandular, but more frequently not so, the barren stem being angular, and always stouter than *cæsius*, the leaves being always quinate, with a white tomentosity beneath. But the most puzzling point respecting it was, that *in the shade* its barren stems were smooth and devoid of setæ, though in full exposure to the sun

* It must be noted that Weihe and Nees have no *R. corylifolius* in their *Rub. Germ.*, but they make the term "*corylifolii*" a sectional distinction for brambles with their leaves green on both sides. Smith's plant and *E. Bot. t. 827* is referred to their *R. dumetorum*, *a. vulgaris*.

† New Edit. of *Eng. Bot.* under *R. coryl.* p. 63.

the cæasian bloom was more or less obvious, with the usual character of numerous prickles scattered irregularly round the stem, with a few intermixed setæ. I sent a glandular specimen with remarkably large foliage to Mr. Leighton, who stated it to be the "second form of *R. rhamnifolius*" of his Flora, differing as to the glands only, the Shropshire specimens having none. This fact still further induced me to name and fix the position of so remarkable a form, which, though traceable to *R. cæsius*, and most certainly closely allied to it, has been considered even by Esenbeck as a variety of *R. rhamnifolius*, as well as of *affinis*. For having obtained authentic specimens of γ . *affinis* from Shropshire, (and indeed this very form had been named "probably *R. affinis*" by Dr. Lindley in the first suite of specimens I had from Mr. Leighton some years ago), I soon found, on reference to other specimens and growing plants, that there was really a complete connexion between it and the "second form of *R. rhamnifolius*;" in short, that they were only varieties of one species; and, therefore, I agree with Dr. Bell Salter that they must be combined. Now, this is a point of difficulty got over; but then, instead of classing them with *affinis*, I place them next to *cæsius*, under the name *R. sublustris*.

The question would here arise, what is *R. affinis*, (W. & N.)? Very few botanists seem to understand it, and the name, as is too often the case among the Rubi, is very bad and deceptive. The *affinity* of the plant is stated by Weihe and Nees to be with *R. plicatus* and *fastigiatus* (that is the suberect tribe),* and hence stouter specimens than usual of *R. suberectus* or *plicatus* have been referred to it, and I may formerly have partaken of the same error. The typical form I consider to be uncommon, except in moist subalpine localities, and this, as far as habit is concerned, may be said to be related to *R. suberectus*. But if Leighton's β . is to be considered as *affinis*, also, then, there is very little like *R. suberectus* about it; for, though the barren stem is almost smooth, or with a very scanty fringe of scattered hairs, it trails along the ground to a great extent, in fact, *longer* than I have noticed any other bramble; and hence, in the 'London Catalogue of British Plants,' I have called it *amplificatus*.

* "Proximam hic frutex cum præcedentibus ambobus tenet affinitatem, quippe cui crescendi modus Rubi fastigiati, folia vero Rubi plicati," is the statement in Rub. Germ.; and really the typical *R. affinis* exhibits the fastigiate growth alluded to, as I noticed in growing specimens last year at Ganllwd, Merionethshire; but I never noticed this to occur in *R. amplificatus*, β . *affinis*.

on this very account, not being satisfied it could rightly belong to *affinis*, whose barren stem is very smooth.* At all events, this *amplificate* *Rubus* is very common, especially in hilly thickets; I have it from various counties, and observed it last summer in North Wales also. But if incongruous forms are not to be allocated together, under one name, then surely I may be allowed to urge that whatever becomes of my *amplificate* bramble, the β . *affinis* of Leighton, and which Dr. Bell Salter, I presume, understands by his var. of Weihe and Nees, "an exceedingly common plant," the *second* form of *rhamnifolius* cannot be joined to it, or the typical *affinis*. It is to be observed, that warm exposed situations, with some moisture super-added, bring out brambles to their utmost dilatation, while everybody knows that pent up in a dark close thicket or grove they become starved changelings. Now, this "second form of *rhamnifolius*," varying into γ . *affinis*, and equivalent to *R. corylifolius*, Sm., for which I proposed the name of *sublustris* in Cat. of Bot. Soc., exhibits, in the fullest exposure to light and in moist localities—as I have witnessed on the banks of the Mellte, in South Wales—a barren stem differing only from that of *R. cæsius* in its much greater size and thickness, with an obvious bloom, and with *short, straight, purple prickles dispersed on every side of the round stem*. This appears to me quite decisive of the matter, for it is really *cæsius* on a grand scale, but is quite different from *R. amplificatus*, the β . *affinis* of Leighton, of which I have seen numbers of growing specimens, the barren stem always angular, without bloom, and the prickles not dispersed irregularly, but confined to the angles.

I have restricted myself, in this paper, to those points that Dr. Bell Salter has either denied, or considered I was mistaken in. The matter between us is purely one of observation, which dried specimens are scarcely adequate to decide. To swim out boldly into the stream of observation, we must throw aside the corks of mere opinion, founded on, perhaps, a badly preserved specimen; and Mr. Leighton's enumeration of the species of *Rubi*, in his 'Flora of Shropshire,' abundantly shows that, like the painter's picture placed for judgment in the market-place, we may find no want of critics, and a variety of opinions, but an unpleasant uncertainty in reaching a sound conclusion.

* Weihe and Nees describe the stem of their *R. affinis* as "glaberrimus;" but Leighton says, in his description of β . "hairy," which doubtless it is, and this is a discrepancy which renders it very inconvenient to combine the two.

With regard to Dr. Bell Salter's own interesting gatherings at Selborne, the foundation of this discussion, not having seen them, I am, of course, precluded from offering an opinion on the deductions he has arrived at from the examination of those particular plants. I can, therefore, only express my cordial *hope* that, for the sake of the learned and acute botanist he commemorates, that his *R. Babingtonii* will not only be enabled to exist beyond its third or fourth year, but take a permanent place in our British Flora. Yet, however we may feel disposed to sport among the forty-seven species of fruticose *Rubi* of Weihe and Nees, or be tempted ourselves to add to the complex number, I feel persuaded that our only rational course is to be guided by the vestiture of the barren stem in its fullest exposure, and so *group our plants by the various distinctions thus presented*, which, as I have previously shown, are only seven, exclusive of *R. Idæus*, which will keep us within moderate limits, and be as near a natural arrangement as possible.

EDWIN LEES.

Powick, near Worcester,
May 17, 1845.

A few Parting Notes. By THOMAS EDMONDSTON, Esq.

INTENSE occupation has, for some time back, prevented me from troubling you and the readers of the 'Phytologist' with several papers I had partly prepared, as I am most unexpectedly and suddenly summoned to go to the west coast of America, no time remaining to put them into the meditated form; but before I go I shall have one parting shot, and briefly notice two or three subjects.

First, then, relative to a discussion on Botanical Classification, between Dr. Ayres and myself. I trust my friend, Dr. A., will not think me uncourteous in not having answered his last paper. Neither do I wish your readers to consider me beat; the fact is, that I did not, owing to a blunder of my bookseller's, receive the number of 'The Phytologist' containing his last letter till several months after its publication, and when I was extremely engaged about matters which brooked no delay; and, as I thought there was little chance of one converting the other, I judged it then better to be silent, at least for a time. It was, perhaps, injudicious in me to have started such a *very* controversial point; yet I must say that nothing Dr. Ayres has said can be considered as at all militating against my position, if it be borne in mind that I merely advocate an "artificial" system as an

introductory means of acquiring knowledge. The controversy has latterly got narrowed down into a discussion on the existence or non-existence, in nature, of *species*: and in his last letter Dr. Ayres brings forward a most extraordinary argument—one, in fact, in which I can scarcely conceive him serious—in support of his views. This argument, which he so triumphantly appeals to, is derived from the inorganic kingdom. Now, Linnæus and other naturalists do use the term *species* as applied to certain forms or aggregations of inorganic matter, but just in the same way as we should apply the term “species” to a particular kind of chair or table; while in organic nature it implies a distinct idea connected with the reproduction of the individuals. I think Dr. A. will require a very little reflection to convince him (I hope he will not be offended at the strength of the term) of the absurdity of such a line of argument. If any naturalist ever used the term *species*, genus, class, or order in the same sense in the inorganic as in the organic kingdom, I never heard of him.

The only other point in Dr. Ayres’ letter I shall notice, is where he wishes to entangle me in a contradiction. I do not happen to have the numbers of ‘The Phytologist’ in which Dr. Ayres or my own papers are, and therefore cannot quote the exact words; but if he refers to my letter again, he will see that I do not talk of the “natural” system properly so called, or the systems of Jussieu, Decandolle, or Lindley, as “débris,” or unconnected fragments: I only say that if, as Dr. Ayres asserts, every plant and animal has its own peculiar niche in a grand system of nature, considering the paucity of species we are perfectly acquainted with, it must be an unconnected and fragmentary scheme; so that he will see that my condemnation of *his* ideas, and my praise of the “natural” system (whose authors disclaim his theory,) are perfectly compatible. Enough of this: my best thanks are due to Dr. Ayres for his courtesy throughout our little passage of arms; and now, save some other champion, not willing to see the immortal Swede, (well and truly called the father of natural science), thrown like useless lumber on the shelf, take up my relinquished lance, this discussion must perforce drop.

I want to say a word or two on *Lastrea recurva* of Bree and Newman. This said fern must be very scarce in Scotland; for anxiously as I have searched for it, I have never yet seen a frond of it growing. As a species, it is one of the most distinct we have; how it has been so much overlooked and confounded is the only wonder. I think great credit is due to Mr. Bree and Mr. Newman for their

able elucidation of it. My friend, Mr. Babington, objects to the name as tending to give a wrong impression of the plant, and wishes the ideas of writers in 'The Phytologist' on the subject. "What's in a name?" we exclaim! Not much now-a-days, when the name is never looked to without the description. It is, nevertheless, desirable that names should be as characteristic as possible, or that at least they should not *teach* error. Such are the only names I would allow should be changed if once imposed. Now, Mr. Babington considers "recurva" as teaching quite the opposite of what is the fact, namely, "incurva:" with regard to the frond of a fern, the two terms must be considered synonymous, though such is not, in strict Natural-History definition, *always* the case. It is rather curious that Mr. Babington's own "pet" name, *concava*, is just in the same predicament, "*convexa*" being equally appropriate; and to put the case arithmetically—as *concava* is to *recurva*, so is *convexa* to *incurva*. Mr. Babington is not here so happy as usual in his Orismology.

I wish, in concluding this *omnium-gatherum* communication, to notice a *Hieracium*, apparently undescribed and distinct, which, during a delightful two months' botanical exploration in Morayshire last summer, I gathered on the banks of the river Findhorn, about six miles above Forbes. The following is a brief description:—

Hieracium nudicaule, Edmond.

Rhizoma long, black, creeping, and tortuous; leaves all radical, lanceolate, sagittate at the base, exceedingly thin and flaccid, slightly pubescent, their petioles villous; scape terminating in a few-flowered corymb of more or less nodding flowers.

Banks of the Findhorn, near Forbes, Morays., July, 1844.

I have since seen a specimen in Dr. Balfour's collection, from Breadalbane, placed in the same sheet with *H. Lawsoni*, from which species it is, however, quite distinct.

Several other apparent novelties occurred in Morayshire, but neither time nor materials are at present forthcoming, to do justice to them.

And now, wishing every success to 'The Phytologist' and phytologists, I hope, on my return from California, to find it and them well and flourishing.

T. EDMONDSTON.

London, 16th May, 1845.

Mr. Edmondston's Appointment to the Harold.

SINCE the foregoing paragraphs were penned, our correspondent, Mr. Edmondston, has sailed in the surveying-ship, *Harold*, bound for the west coast of North America. Knowing his zeal, industry and ability in the cause of Phytology, we anticipate great results from his appointment as Naturalist to the Expedition. Most heartily do we return the good wishes he bequeaths us as a parting legacy: may success attend his exertions, and may they prove equally advantageous to science and honorable to himself! The Californian plants which have hitherto reached this country through other channels, give promise of a plentiful harvest still to be reaped; and with youth, health and energy on his side, we can scarcely point to an individual so well fitted as Mr. Edmondston for such an undertaking.

Discovery of Lychnis alpina in England. By RICHARD MATTHEWS, Esq.

HAVING nowhere seen *Lychnis alpina* recorded as a native of Cumberland, I send you a specimen of that plant, which was gathered in a narrow and deep ravine of Hobeartin Fell, a clay-slate mountain, which rises from the Vale of Lorton. When found, it was growing at an elevation of about 2,000 feet, and had done flowering; but being preserved, and planted in my garden, it produced the head of flowers which I now inclose, thus affording an instance that *Lychnis alpina* inhabits the mountains of Cumberland. RICHARD MATTHEWS.

Wigton Hall, May 26, 1845.

Notice of the 'London Journal of Botany.' No. 40, April, 1845.

THE first paper in this number is a valuable communication by Mr. R. Spruce, headed, 'On some Mosses new to the British Flora.' It contains descriptions of twenty-three mosses apparently new to Britain (four of which are now for the first time described), together with remarks on their affinities, synonymy, and other particulars. We give translations of the characters of such as do not seem to have been previously published.

1. *Bryum erythrocarpon*, *Schwaeagr.*

Moist sandy stubbles between Barmby and Woodhouse Moors, near Pocklington, Yorkshire; Stockton Forest.

2. *Bryum lacustre*, *Bridel*.

“‘Gathered at Ealing, forty years ago, by Mr. Eagle.’—*Borrer in litt.*, Apr. 1844.”

3. *Bryum torquescens*, *B. & S.*

“‘Among *Bryum nutans* on a small rock on the shore of Gormire Lake, near Thirsk, Yorkshire.’—*Mr. Borrer*.”

4. *Bryum uliginosum*, *B. & S.*

Heslington Fields, Nov. 1841; fruit mature in August and September: Castle Howard, Scalby-mills near Scarbro’, Whitby and Sandesend, Pilkington near Manchester, Wythburn Beck near the junction of Cumberland and Westmoreland.

5. *Hypnum elodes*, *n. sp.* Stem slender, branched, branches pinnate; leaves loosely imbricate, those on the stem spreading, lanceolate, much acuminate, those on the branches erecto-patent or somewhat secund, all entire, with the nerve extending to the point.

Wet places on Stockton Forest, near York, Aug. 1842.

6. *Hypnum polymorphum*, *Hedw.*

Wet limestone at Crambeck, and ruins of Kirkham Abbey.

7. *Hypnum pratense*, *Koch.*

“‘Road-sides among thin grass, near Capel, Surrey, and Henfield and Shindon, Sussex; without fruit.’—*Mr. Borrer*.”

8. *Leskea pulvinata*, *Wahl.*

By the Ouse, near York, Oct. 30, 1841. By the Cock, near Tadcaster; by the Mersey, near Withington, four miles from Manchester.

9. *Leskea Sprucii*, *Bruch, MSS.* Stem erect, very slender, dichotomously branched; leaves loosely imbricate, erecto-patent whether in a dry or moist state, narrow-ovate, acuminate, nerveless, sparingly denticulate, perichætil leaves spinuloso-serrate; pedicel smooth; capsule small, oval, somewhat erect; operculum conical, obtuse.

Basaltic rocks in a shaded situation by the Tees’ side below Winch Bridge.

10. *Mnium stellare*, *Hedw.*

Gilla-leys wood, Castle Howard, Jan. 1841; Mowthorpe Dale with perichætia, Jan. 1844. Matlock-bath, Castle Conway, Todmorden, Teesdale.

11. *Orthotrichum coarctatum*, *Pal. Beauv.*

Trees in Castle-Howard woods.

12. *Orthotrichum fastigiatum*, *Bruch in Bridel.*

“‘On trees by a footpath between Greta-bridge and Rokeby; 1810.’ *Mr. Borrer*.”

13. *Orthotrichum pallens*, *Bruch in Bridel*.

With *O. Sprucii*, in Clifton Ings, near York; June, 1842.

14. *Orthotrichum pumilum*, *Schwaeagr*.

Ash-tree in Clifton Ings, near York; April, 1843.

15. *Orthotrichum Sprucii*, *Montagne in litt*. Monœcious, somewhat pulvinate; stem somewhat branched; leaves erecto-patent, ligulate-oblong, rounded and minutely apiculate at the apex, keeled, widely areolate, margin recurved, nerve vanishing near the apex; capsule obovato-pyriform, short-necked, with 8 narrow striæ; calyptra campanulate, naked; teeth of the peristome bigeminate, horizontal when moist, reflexed when dry.

“Near Glasgow, 1824.” — *Dr. Walker-Arnott*. Banks of the Ouse, Wharfe and Cock, Yorkshire; by the Derwent near Matlock Bath; Henfield, Sussex; Burford-bridge, Surrey; near Bristol; near Twycross, Leicestershire.

16. *Orthotrichum tenellum*, *Bruch in Bridel*.

Trees by the Cock near Tadcaster, and by the Derwent, at Matlock bridge; near Castle Howard; Beaumaris; Dundry, near Bristol.

17. *Phascum Floerkeanum*, *Web. & M.* var. β .

Stubble-field south side of Bulmer Hagg, near Castle Howard.

18. *Ph. triquetrum*, *n. sp.* Monœcious, scarcely stalked; leaves trifarious, connivent, obovate, apiculate, boat-shaped, keeled, margin reflexed, nerve excurrent; capsule large, horizontal, spherical, immersed.

Summit of cliffs between Brighton and Newhaven, discovered by Mr. Borrer, in April, 1844.

19. *Tortula ambigua*, *B. & S.*

On a mud-capped wall by the road out of New Malton towards York, Nov. 19, 1844.

20. *Tortula marginata*, *B. & S.*

Sandstone walls and rocks near Castle Howard, most abundant in the park quarry. Stone-pits at Henfield, *Mr. Borrer*.

21. *Tortula papillosa*, *Wils. MSS.* Rather tufted; leaves obovate, truly concave, spreading, margin involute when dry, widely areolate, papillose, nerve produced into a mucro or hair.

Huntington, near York, 1843. Castle Howard park; Llan·saintffraid.

22. *Tortula squarrosa*, *De Notaris*. Loosely pulvinate-cæspitose; leaves linear-lanceolate, sheathing at the base, squarrose, somewhat tortuous, pagina inflexed and undulated, granulose beneath, margin somewhat denticulate, nerve stout, not produced.

“On the beach at Hastings and in Beeding chalk-pit, Sussex; in both stations without fruit.” — *Mr. Borrer*.”

23. *Tortula vinealis*, *Bridel*, *ß. flaccida*.

“On a stone by the Keswick road just out of the village of Ireby, where it formed one large patch.”—*Mr. Borrer*.”

The next paper is also an addition to Muscology, from the pen of Mr. Wilson; being a ‘Description of a new British, and a new American species of *Fissidens*.’ We give the characters of

Fissidens Bloxami, *Wils*. Stem simple, very short, declining; leaves obliquely linear-lanceolate, acute, immarginate, denticulate, the dorsal lamina ending above the base; pedicel terminal; capsule erect; operculum obliquely rostrate from a conical base, ring revolute.

“Orton Wood, near Twycross, Leicestershire, on clayey banks with *F. taxifolius*, April, 1844, by the *Rev. A. Bloxam*. Fruit ripe in January.”

The American species is *Fissidens obtusifolius*, (*Wils*.) On a dripping rock, Cincinnati, *J. G. Lea, Esq.*, 1848.

Under the head of ‘Botanical Information,’ we find a reprint of Mr. Watson’s Circular relative to the discontinuance of his great work on ‘The Geographical Distribution of British Plants,’ previously noticed (*Phytol.* i. 635). In place of this work, the design of which was found to be too extensive to allow of its being completed with a reasonable time, it is Mr. Watson’s intention to bring out three separate treatises, under the heads of—1. Botanical Geography: 2. Areas of British Plants: and 3. Localities of British Plants. Under each of these heads the circular contains separate and distinct specimen-pages, so printed as to exhibit the plan of each of the three books; the printer of the Journal has however contrived to defeat Mr. Watson’s object, by most ingeniously combining the three specimens into one (certainly *not* harmonious) whole.

In a short article on ‘*Cistopteris montana*,’ discovered by Mr. Wilson on Ben Lawers in 1836 (*Phytol.* i. 671), the editor of the Journal states that he has examined Plukenet’s volumes in the British Museum, with a view of verifying Swartz’s reference to “*Pluk. Phyt. t. 89, f. 4, ‘Filix alpina Myrrhidis facie Cambro-Britannica, &c.’*” but that no corresponding specimens exist there; so that the supposition of its having been found in Wales by Petiver, appears to be without foundation. In Buddle’s and Petiver’s herbaria are Welsh specimens “corresponding with Plukenet’s figure, whose synonym is quoted; and these plants are *Aspidium spinulosum*, so that to us it appears clear that that is the species intended by Plukenet. Mr. Wilson will therefore remain the first discoverer of it in Britain. We may add, that it is a native of the Rocky Mountains, in North America, and, as such, is described in Hook. Fl. Bor.-Americana.”

Notice of the 'Annals and Magazine of Natural History.' Nos. 98 and 99. Dated April and May, 1845.

THE April number contains the following botanical paper : —

'A Century of new Genera and Species of Orchidaceous Plants. Characterized by Professor Lindley.'

In the May number are two botanical papers, as under : —

'Descriptions of Three new Species of *Rubus*. By T. Bell Salter, M.D., F.L.S.' We give translations of the characters of the two first of these new species.

1. *Rubus tenuis*. Stem procumbent, round, somewhat glaucous; prickles equal; leaves ternate, rarely quinate, somewhat glabrous above, pubescent beneath; leaflets obovato-acuminate, doubly serrated, lateral leaflets lobed outwardly; panicle decompose, rarely cymose; calyx pubescent, lanceolate, acuminate, appressed to the fruit; fruit small, black, composed of few large drupes.

Var. β. ferox, prickles frequent, hooked.

Syn. *Rubus affinis*, *δ.* (*W. & N.*) *Rubi Germ.* 3, t. 3 *b.* *Rubi cæsii* et *R. corylifolii pars auct. var.*

Hab. Various places in the South of England. *Var. β.* at "Ape's Down," in the Isle of Wight.

2. *Rubus Borreri*. Stem procumbent, round, prickly, clothed with spreading hairs; prickles frequent, long, slender, hooked; leaflets quinate, obovate-wedge shaped, somewhat glabrous above, with concolorous hairs beneath; panicle corymbose, lower branches long, decompose, upper branches shorter, terminal flower somewhat sessile; prickles of the panicles few, peduncles pubescenti-hirsute; bracts lanceolate, hairy, lower ones ternate or dentate, upper ones simple; calyx ovate-lanceolate, much acuminate, pubescenti-hirsute, loosely embracing the fruit; fruit black, hemispherical, composed of small shining drupes.

Inhabits the Isle of Wight.

The reader will please to turn to a former number (*Phytol.* ii. 138), for a detailed account of the third species (*R. Babingtonii*); and to the Report of Proceedings of the Botanical Society of London in our present number (*Id.* 191), for further remarks on all the species.

'On the correct Nomenclature of the *Lastrea spinosa* and *L. multiflora* of Newman. By Charles C. Babington, M.A., F.G.S., F.L.S.'

With regard to Mr. Babington's paper, we are compelled to express our regret that it should have ever seen the light, since it is calculated to lead into error all those who blindly adopt this

author's suggestions, and to prejudice him very materially in the estimation of all who enquire for themselves. It is well known to those who have paid any attention to our British ferns, that Smith, (followed by Mr. Babington), applied the name of *dilatata* to a group of species which he supposed to constitute but *one*. Hooker subsequently applied the name of *spinulosa* to the same group. Continental authors have generally adopted the same plan, sometimes giving one name, sometimes another, according as they considered one or other name possessed the claim of priority. Mr. Newman, in the 'History of British Ferns' just published, has shown that this group comprised several species, three of which he proves have been clearly described before under the names of *multiflora*, *spinosa*, and *recurva*: he therefore adopts these names, because the other names, though perhaps having the claim of priority—as Mr. Babington attempts, but not satisfactorily, to explain—were never applied to species, but to families, or groups of species. The object of Mr. Babington's present paper is to sink the names of the species altogether—to assign one synonyme to one species, and another synonyme to another species. This is very illogical. Linneus himself included several species of *Ophrys* under the name of *insectifera*; but we never think of debating whether that name shall be assigned to the 'Bee' or to the 'Fly.' Papers like this of Mr. Babington's do infinite mischief. We hope we shall see no more of them.

Notice of 'A Catalogue of British Ferns, including the Equisetaceæ and Lycopodiaceæ: intended for Labels. London: Edward Newman, 9, Devonshire-street, Bishopsgate. 1845.

THE author's object in printing this Catalogue, is to introduce a greater uniformity in the nomenclature of British Ferns. Until lately, scarcely any attention had been given to this subject; and if he has succeeded in detecting and correcting a few errors, it is no more than was to be anticipated from the labours of any one who ventured on a task from which all others appear to have shrunk, from a feeling of distaste. Such a circumstance should never be viewed with jealousy or distrust. The author's own collections, deposited with the Linnean Society and other public bodies, will be labelled with this Catalogue; so that until an abler hand shall supply another 'History of British Ferns,' the present names must be considered to carry with them that degree of authority which is ever granted to the compiler of

a careful Monograph. Under every name, the author gives a reference to the corresponding figure of the species or variety ; so that no confusion can creep in as to the plant intended to be indicated by the name. As every collector of British Ferns must possess himself of this Catalogue, its appearance at the present moment may, in some degree, act as an antidote to the unwholesome attempts now making to introduce ill-judged alterations.

Proceedings of Societies.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, April 10, 1845. Dr. Seller, V.P., in the chair.

A valuable donation to the herbarium was announced from Robert Brown, Esq., London, consisting of South American plants, collected during Captain King's voyages. The special thanks of the Society were voted to Mr. Brown.

John Robert Oliver, Esq., was elected a Resident Fellow of the Society.

The following communications were read : —

1. On a monstrous variety of *Gentiana campestris*. By Dr. Dickie, Lecturer on Botany, University and King's College of Aberdeen.

2. On the correct nomenclature of the *Lastrea spinosa* and *L. multiflora* of Newman. By Charles C. Babington, M.A., F.L.S., &c.

3. Dr. Balfour read an Account of a Botanical Trip to the Mull of Cantyre, and the island of Islay, undertaken with his pupils in August, 1844. He gave a general account of the geological features of the districts, and noticed the more important plants which were picked by the party.

BOTANICAL SOCIETY OF LONDON.

May 2, 1845, Edward Doubleday, Esq., V.P., F.L.S., in the chair. Donations to the Library were announced from the Medico-Botanical Society, and the American Philosophical Society.

Mr. S. Osborn presented some seeds from Bombay. Dr. Lloyd, F.G.S., and John Coppin, Esq., were elected members.

The following paper was read : —

“Remarks on some specimens of *Rubi* sent to the Botanical Society of London, by T. Bell Salter, M.D., F.L.S.

“The accompanying specimens are of forms of *Rubi*, descriptions

of which appear in the May number of the 'Annals of Natural History.' [See ante. p. 189.]

"Desirous that the Botanical Society might possess early specimens, the accompanying ones are sent. It is acknowledged that the specimens are small, and some imperfect; but I have preferred sending immediately such as I can afford, to delaying till another year's collection. That the specimens may not appear altogether without remarks, I offer the following hasty ones:—

"*Rubus tenuis* is by no means an unfrequent bramble, having the habit of *Rubus cæsius*, from which it is distinguished by its black fruit, and the absence of hairs and glands in the surculi. The sepals are broader, and the fruit, though pleasantly acid, has not that extremely fine flavour which belongs to *R. cæsius*, and which, once observed, cannot be forgotten. In the plates of *Rubus affinis*, in the work of Weihe and Nees, one variety (8) is figured with reflexed calyx. As this is the principal artificial character which distinguishes the present from the more slender forms of that species, no doubt rests on my mind that that drawing must have been taken from a plant of this species; an opinion in which I am confirmed by having noticed, in the Herbarium of Mr. Borrer, a specimen of Mr. Leighton's, which Nees had labelled as a variety of his *affinis*. In this country I believe it has commonly been included under *Rubus cæsius*, and probably sometimes under the convenient name of *Rubus corylifolius*. The variety labelled "*var. ferox*," in the accompanying specimens, is distinguished from the other form by the greater number and size of the prickles.

"*Rubus Borreri*, which I have so named in honour of my excellent friend, Mr. Borrer, in acknowledgment of his successful labours in this genus, belongs to the section of which *Rubus villicaulis* (W. & N.) may be considered the type; but it is distinguished from all the species allied to it by its corymbose panicle, and by its long sepals, which, instead of being reflexed, loosely embrace the fruit.

"The remaining specimen to be referred to, I have named *Rubus Babingtonii*, after my friend the distinguished author of the 'Manual of British Botany.' It is a remarkably large plant, combining the hispid stem of *rudis* with the shaggy clothing in the panicle of *leucostachys*, from both of which it is abundantly distinguished by its ternate leaves, and the breadth and crenate margins of its leaflets."

—G. E. D.

Rus in Urbe. By EDWARD NEWMAN.

It seems most forcibly impressed on me that I am never more to ramble at leisure among our ferns in their native homes; and, consequently, never to enjoy the opportunity of studying differences where alone they are to be satisfactorily determined. Combined with this feeling is a knowledge of the fact, the irresistible, the manifest fact, that I have left much to be done. In *Cystopteris fragilis*, a group rather than a species, nothing satisfactory has yet been accomplished, not one step has been taken in the right direction. It is true, we have five names, and those botanists who delight in multiplying species, or who estimate the value of their herbarium by the multitude of its names, apply these names according to their pleasure, often making the most ingenious and fanciful combinations: but, with this exception, which may be called playing at Botany, not a single step has been taken towards ascertaining whether we really possess more than one British species of *Cystopteris*: on the other hand, it may truly be said, we have no reason to give for grouping together so vast an assemblage of heterogeneous forms. In *Filix-femina* we have advanced a step further; but still no more than a step: although forty-five years have elapsed since Roth elaborately described five species of this family, and nearly fifty years since Hoffmann characterised a similar number; no British author has ever enquired whether the characters given by these eminent botanists are sufficient or insufficient, or whether we possess in this country one species or five. In the group, called by Hooker *Aspidium spinulosum*, it has been shown that five most distinct and unvarying species had been "rolled into one"; and these have at length been extricated with some exactitude under the names of *Cystopteris montana*, *Lastræa recurva*, *L. spinosa*, *L. multiflora*, and *L. rigida*. But is no more to be accomplished? are we sure that we have no other species equally distinct? I cannot for a moment doubt that the task is still imperfectly accomplished. Our knowledge will not remain stationary at this point, now that attention is awakened: the result will be sure to reward the diligent enquirer.

Perhaps there is egotism even in recurring to our errors: I think it is so; and yet I cannot refrain from reverting to mine, since I fear they tended to repress investigation, and, consequently, to retard elucidation. When very young in the study, I drew conclusions from insufficient data, a practice far too common. I found that Smith described a fern under three names, calling the more perfect form,

Aspidium dilatatum, the young, *Aspidium spinulosum*, and a blighted frond, *Aspidium dumetorum*; hence I concluded that we had but one species of this family in Britain: the only just conclusion would have been that Smith described but one. *Cystopteris fragilis* is described three times by the same author; *Athyrium Felix-femina* twice; *Polystichum aculeatum* twice; and so on. These facts, logically viewed, in no degree militate against the existence of many cognate British species. The only just inference to be drawn from such facts must bear reference to the ability or inability of the author. It cannot bear on the plants which he does or does not describe. Well had it been for me had I then read some clearly expressed treatise on logic, like the masterly productions since published by Duval-Jouve and Mill. I might, in that case, have escaped manifold errors.

* * * * *

Even with those who seek the truth with singleness of purpose, several barriers exist to the attainment of precise knowledge: one, and a most formidable barrier it is, may be observed in the almost ineradicable propensity to regard differences resulting from age as indicative of specific distinction. I never recollect meeting with a botanist who would wish to seize on a young dicotyledon, and raise it to specific honours: I never saw an entomologist treasuring a caterpillar or a chrysalis, as something totally distinct from the imago: neither do we see the botanist contrasting the seedling sycamore with the giant oak; nor the entomologist comparing the caterpillar of a moth with a perfect butterfly; yet such feats are commonly performed by the collector of ferns, and the common characteristics of babyhood are regarded as indicating nondescripts. This is no recent foible; our great Ray made a species out of the seedling or larva of *Oreopteris*; and Smith, who detected the error, still gives the seedling as a variety, and, with ludicrous gravity, designates it as *Oreopteris* β . Why do we not follow the example of the botanist who rears his plants from seed; or the entomologist, who raises his butterfly from the egg? I do not counsel a pteridologist to reject all information to be derived from seedlings, but most strenuously do I recommend him always to regard them as mere stepping-stones to knowledge, and as incidents in the life of a species, whose history is not to be written until it has attained maturity.

But, although the seedling of a fern is unavailable for scientific description, the young frond of the mature plant is an invaluable auxiliary, a safe pilot, in our search for truth; and I believe there is not a botanist living, who, had he watched the fronds of mature roots

of *recurva*, *spinulosa* and *multiflora*, as they gradually uncoiled, and by slow degrees developed their various divisions, but would long ago have pronounced these species as different from each other, as any of those which he had always acknowledged to be such. *Recurva*, while expanding, may, by the unpractised eye, be passed as *Pteris aquilina*, or as *Polypodium robertianum*, but never as either of those species to which it has been so unnaturally united.

A second barrier to the discovery of truth, is the imperfection of the specimens selected for preservation. It has been an almost invariable rule to select *convenient* rather than *characteristic* specimens. I use the modifying "almost," not because I have met with an exception, but because my knowledge of herbaria is not so complete as to warrant my saying the rule is invariable; the full-grown, full-fruited, mature, characteristic fronds, are rejected as inconveniently large, except, indeed, in the rarer and smaller species, which being supposed valuable in proportion to their magnitude, are generally selected by size; thus we invariably find the largest possible *Lastræa rigida*, and the smallest possible *Lastræa Filix-mas* placed side by side, as the truthful representatives of the respective species: the largest possible *Allosorus crispus*, and the smallest possible *Pteris aquilina* always perform the same office, and quite as unfaithfully. For the common species a mere fragment is generally supposed sufficient. In the herbaria of Linneus and Smith, the great authorities for reference, a bit nipped off at random, frequently suffices to exemplify a species. May I venture, as one who has experienced the difficulty of drawing satisfactory conclusions from such materials as these, to recommend an entirely new plan in the preservation of ferns?—that is, to select fronds, of whatever species, of full size, of full developement, in full fructification, and perfect from the very apex of the frond to the very base of the stipes; and if a portion of the rhizoma and root can be included, so much the better. When the rhizoma is a running one, as in *Thelypteris*, its preservation is indispensable.

A third barrier is the disposition to preserve and value malformations and monstrosities, whether originating in blight, injury, or other casualties. This taste prevails more generally than I could have believed, had I not repeatedly been required to inspect as inestimable treasures, fronds with two tips, or deficient in the pinnæ on one side, or curled to the right hand or to the left. Far be it from me to depreciate any fact, or class of facts, but this taste induces attention to matters that are totally at variance with the elucidation of species.

A fourth barrier is the disposition to regard certain plants as under the influence of a kind of ban or proscription: thus, who does not pass the most beautiful ferns with the conclusion, expressed or felt, "Oh! that is only *spinulosum*," or "only *Filix-femina*." These decisions are totally unaccompanied by any examination; they are made quite off-hand, and with the greatest possible confidence: thus we rivet the fetters of ignorance on our own minds, and cherish them with admirable complacency.

I look forward with ardent hopes to the day when all ferns shall be collected, or at least examined with equal zest; when the taste for deformities shall cease; when specimens for preservation shall be carefully selected, the full-grown, the perfect, the mature; when seedlings shall cease to be regarded with interest, except as the progeny of the respective parents. We require competent observers, multiplied observations, and abundance of specimens such as I have described. *Then* truth may enter largely into our conclusions; at present we draw inferences from hypotheses, like the young housewife who regarded her cookery-book as sufficient for the manufacture of a pudding, and so neglected to provide the ingredients.

* * * * *

What are the casements lined with creeping herbs,
The prouder sashes fronted with a range
Of orange, myrtle, or the fragrant weed,
The Frenchman's darling? are they not all proofs
That man, immured in cities, still retains
His inborn inextinguishable thirst
Of rural scenes, compensating his loss
By supplemental shifts, the best he may?

* * * *

There ferns and equisetums planted thick
And watered duly. There the pitcher stands
A fragment, and the spoutless tea-pot there;
Sad witnesses how close-pent man regrets
The country; with what ardour he contrives
A peep at nature, when he can no more.

In the first of these passages, Cowper's prophetic eye foresees the taste of Devonshire-street generally; in the second, he individualises a house, evidently No. 9. I have long taken an interest in the horticultural pursuits of my neighbours. Many and many a plant have I seen purchased, cherished, watered, nursed, and killed: a valuable table might be compiled for the "statistic section of the Bri-

tish Association for the advancement of Science," showing the average life of a horse-shoe geranium, a verbenia, a myrtle, a heath, or a Fuchsia, when translated into the—atmosphere—I was about to write soil—of Devonshire-street. The myrtle, I think, enjoys the maximum, and the blue bell (*Scilla nutans*) the minimum of existence; the latter is imported every spring, "all-a-blowing, all-a-growing," from the woods of Kent and Surrey; but never lifts its head amid the impurities of our atmosphere.

Without any attempt to ascertain the causes of this mortality, indeed, bowing implicitly to the researches of Mr. Ward, who has so ably investigated "the causes which interfere with the natural conditions of plants in large towns,"—I could not but conclude that the air contained or conveyed something eminently fatal to vegetable life: while, on the other hand, the partial success of the Wardian cases induced me to believe in the possibility of excluding all that was injurious: in fact, I imagined I could get up an atmospheric establishment on a small scale, which should have but little connexion with the atmosphere of the metropolis. I have said "the *partial* success of the Wardian cases;" for candour compels me to add that I consider the success of the Wardian cases incomplete. The enclosed plants adopt too literally the plan of self government: they incontinently run their heads against the glass, which is always streaming with condensed vapour, and, in that position, flatten their faces and decay piecemeal. Then, again, you very rarely obtain a comfortable view of the interior of a well-filled and well-closed Wardian case: the water on the glass, and the exuberant growth of some of the plants, greatly interfere with this: how often does some luxuriant monster overwhelm and stifle the rarer and more tender species, on which you happened peculiarly to have set your affections! "Aye!" says Mr. Ward, "this is perfectly true if the cases are not properly managed, but not otherwise; all the evil arises from mismanagement." Bad management may be the cause of all these disagreeables: I will not contest the point; but, judging from the numerous cases I have seen, I think I may safely state that *bad* management is the rule, *good* management the exception: for closely glazed cases are almost invariably labouring under the difficulties enumerated.

* * * * *

Submitting with resignation to the belief that I was never more to enjoy the opportunity of watching my favourite ferns perform their various acts of existence in a state of nature; confident of the necessity of such watching before I made any further progress in their his-

tory ; satisfied of the impossibility of growing them, exposed to the atmosphere of Devonshire-street ; dissatisfied with the effects of closely glazed cases ; I still determined to make trial of a plan that should bring these wildings of the woods to my own door, and give them the advantages, without the disadvantages, of a Wardian case. Should the trial prove successful, should the results appear worth communicating, I may resume my pen and scribble a few more disjointed paragraphs, as a continuation of the present paper.

EDWARD NEWMAN.

9, Devonshire Street, City,
14th June, 1845.

Remarks on Rubus diversifolius of Lindley.

By T. BELL SALTER, M.D., F.L.S.

WITHOUT wishing to become controversial, there is yet one point in the communication of Mr. Lees, on which a few words appear to be required ; and it is one which involves the question, what *is* the *R. diversifolius* of Professor Lindley ? I believe all the difficulty and doubt of the matter, may, at once, to adopt the facetious metaphor of Mr. Lees, be solved by the fact, in Dr. Lindley's case, of "the father not knowing his own son." In the first edition of his Synopsis, Dr. Lindley first describes a species by this name, which is placed in the section with hairs and "neither bloom nor glands." The description agrees with the form which is the *R. vestitus* (W. & N.), and which I enumerate in my Selborne list as a variety of *R. leucostachys* ; and the Horticultural Society's garden furnished Mr. Borrer with precisely this very form from the authentic plant of *diversifolius*.

Subsequently to this, a second edition of the Synopsis appears, and a specimen is named by Professor Lindley for Mr. Leighton. The order of priority of these two latter circumstances I do not know, nor is it material ; but that which concerns the point at issue, is as follows :—a specimen of *R. dumetorum* was named, and that by the author of the supposed species, *R. diversifolius* ; and, coincidently with this, in the second edition of the Synopsis, though the description itself is not materially altered, it is yet ranged under a fresh section—that "with glandular bristles." The fact of Dr. Lindley's having named a glandulose specimen as *diversifolius* for Mr. Leighton, I had been aware of from Mr. Borrer's herbarium ; and I confess I was a little amused at so distinguished a Professor mistaking a species of

which he himself was the author. Still I considered the mistake as only accidental,—a mere *lapsus* as it were, until, after my remarks in the 'Phytologist' were published, I observed on comparing the two editions of the Synopsis, that *diversifolius* had, in the second edition, been transferred to another section; and that thus, in truth, the name had been applied to another plant, though without any comment to shew that the author had intended or was even aware of the transference. In addition to this negative evidence, the authority of "*Ed. pr.*" placed after the name in the second edition, may be looked upon as so far a positive evidence that this change was made unwittingly.

The whole of the confusion, therefore, on this subject, rests with the author of the supposed new species, and it at once becomes evident that by the name *Rubus diversifolius* (Lindl.), Mr. Lees, with the second edition of the Synopsis, and Mr. Leighton's specimen to support his opinion, refers to one plant; whilst I, with the original description in the first edition, and the authentic plant in the garden of the Horticultural Society to support my view, refer to another. Were the forms to which the name had been applied, species which had not received previous names, it would be for decision, which is the *R. diversifolius*, and in that case I believe every admitted rule of scientific nomenclature would have applied it, as I, as a name of synonymy merely, have done in my former communication. But, as each form had already been described and figured by Weihe and Nees, this question becomes quite immaterial.

One consideration, however, arising from this error is worth noticing; and that is, that it quite alters the force of Dr. Lindley's reflection respecting Mr. Borrer's opinion of the identity of *diversifolius* and *leucostachys*, which I quoted in my former observations on this subject (p. 106). Mr. Borrer's opinion was founded on the first edition of the Synopsis and the eglandulose plant there intended, while the Professor's remark was made on the supposition that Mr. Borrer had actually considered the glandulose *dumetorum* to be only a variety of *R. leucostachys*! One can well imagine his surprise, though the cause of the mistake thus appears to be on his own part. The variety *vestitus* contrasts very remarkably with the typical *leucostachys*, but of course in no degree to be compared with the difference between these two widely separate species.

I have read with much interest and pleasure the paper of Mr. Lees, to which I have referred above. With respect to some other points in his communication, in which I hold opinions different from his—having no wish for controversy, I shall not now reply to them, but

only bring forward any fresh remarks on this subject as facts and observations shall furnish them, and then I hope I shall be equally ready to offer them whether they tend to confirm or change the opinions I now hold. The present communication, however, appeared to be called for, to put in a proper light that which we had both written, or I would not again have so soon troubled the readers of the 'Phytologist' with any fresh remarks on a subject, which I fear is not of very general interest.

T. BELL SALTER.

Ryde, June 14, 1845.

On the meaning of the word recurvus.

By T. BELL SALTER, M.D., F.L.S.

I HAVE read with much pleasure Mr. Watson's lucid remarks on the meaning of the word *recurvus*, and certainly very desirable it is that some definite idea should be attached to a term, on which there appears so much diversity of opinion. In all the ornithological and entomological instances of the use of this word, which have been adduced, the curvature is in a direction from the *face* or the *venter*, towards the *dorsum*, which is, as Mr. Watson says, "contrary to the usual direction." It is, however, I apprehend in force of the former fact,—the part being bent toward the *dorsum*,—that the term is used, for if it come to be considered as merely signifying its being contrary to the usual direction, it at once ceases to be an absolute term, and will convey no certain meaning to the person whom it may be intended to enlighten by a description,—he not being aware what may be the usual direction in that particular tribe or genus;—or even *species*, for where is a limit to be drawn, where a mere comparison is indefinitely implied?

Now, from the numerous definitions from the highest authorities, so carefully cited at page 118 of this work, it would appear that in *Botany*, as well as in Ornithology and Entomology,—and Mr. Watson's definition of *re* implies the same,—it would appear, then, that here too the particle *re* gives the sense of backwardness in the direction; a curving or bending towards some real or supposed back or dorsum. The question is, therefore, what is the back or dorsum in any part of a plant. Common acceptance has universally applied it to that surface of any part, which is situated outwardly before its having expanded; and, in accordance with this, we have *in* applied to every curvature, which, supposing the part in question to

be unexpanded, would be towards the axis of the plant, as *involutus*; and *re*, with the solitary exception of the controverted *Lastrea*, to a curvature, which, on a similar supposition, would be in the opposite direction, as *reflexus*.

Every one understands the words *involute* and *revolute* as applied to leaves, and with respect to ferns every one attaches the idea of the back or dorsum to that side on which the sori are placed. In fact, the term is universally applied in the definition of the *Polypodiaceæ*, viz., the fructification being placed on the *back* of the frond, which is, in fact, that side which before unfolding is directed outwardly from the axis of the rhizoma.

According, therefore, to the universal application of the particles *in* and *re*, a fern would be incurved or inflected, which is concave on the polished or smooth surface, and recurved or reflexed if concave towards that which bears the sori, and that alike whether the bending happen to be upwards or downwards. The name "*recurva*," therefore, as applied to the *Lastrea* of Bree, would appear to the author of these remarks, to be used in a sense in every way isolated and exceptional.

T. BELL SALTER.

Ryde, June, 1845.

Catalogue of Plants observed in the neighbourhood of Fareham,

Hants. By W. L. NOTCUTT, Esq.

IN offering a contribution towards a Flora of this neighbourhood, a few remarks with regard to the locality may not be useless. Fareham is situated at the north-west corner of the inlet known by the name of Portsmouth Harbour; but which is, in fact, a kind of lake, measuring about four miles by four or five; and communicating with the sea by a neck about a mile wide, on one side of which lies Gosport, and on the other Portsea and Portsmouth. This lake is, however, little more than a large bed of ooze for the greater part of its extent, but being subject to the influence of the tide, affords support on its margin to a considerable number of maritime plants. The district here attempted to be elucidated comprehends a circuit around Fareham, varying in its distance from the town from two to four miles; Hill Head, the farthest point of it, being about the latter distance: the average may, however, be taken at about two miles and a half. On the east side it includes Portchester and the neighbouring shore, taking in the west end of Portsdown, on which stands the monument

erected in honour of Nelson. Boarhunt, and Millis's Bottom, a common about a mile from Wickham, are the limits on the north-east, and Fontley, and the south side of Titchfield common on the north. On the south and west it includes the river-side from Titchfield to Hill Head: also Stubbington, and the Gosport road and its neighbourhood for about the distance of two miles. In mentioning Titchfield common, it must not be supposed that I include the whole of it: but the part to which allusion is so frequently made in the ensuing list, is that which borders the sides of the Southampton road as far as the point where it is joined by the road from Cattisfield: and also a small part of the common a little beyond West Hill, the seat of Sir H. Paulett. It is in this last mentioned part that most of the bog plants were found.

The chalk formation embraces a large extent of country on the east side of the town, and generally lies near, or comes to, the surface; and on the west the London clay is the prevailing substratum, though gravel, sand, &c., overlie it in many places.

It must not be supposed that the following list professes to be by any means a complete one, as it is the result of the labours of only three summers, and my time for botanical pursuits is but limited. I do not doubt, therefore, that further research would bring to light many plants not included in this list, and prove this neighbourhood to be excelled by few in richness and variety. As, however, my residence here will probably soon terminate, I do not suppose that I shall be able to complete the task. I may just allude, as a singular circumstance, to the excessive rarity of *Draba verna* here; one or two plants being all that I have met with. The figures refer to the comparative rarity or frequency of some of the species; their signification is the same as in the Edinburgh Catalogue. I regret that my brief acquaintance with the neighbourhood will not justify my applying them to all.

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5. *Ranunculus arvensis*. Uplands; near Gill copse, &c.
 5. ——— *Flammula*. Titchfield common; Peel common, &c.
 6. ——— *acris*. Gosport road, &c.
 6. ——— *Ficaria* and *bulbosus*. Very common.
 - *aquatilis*. Fontley; near Titchfield common, &c.
 - β *pantothrix*. Stubbington; Fontley iron-mills.
 - *sceleratus*. Stubbington; Boarhunt.
 - *auricomus*. Gill copse; Uplands.

4. *Ranunculus hederaceus*. Titchfield common; Boarhunt; Stubbington.
 —— *hirsutus*. The Salterns.
 —— *repens*. Near the railway station, &c.
5. *Clematis Vitalba*. Maindell chalk-pit; Fareham common.
5. *Anemone nemorosa*. Gill copse.
 Caltha palustris. Gill copse; near Place House.
1. *Thalictrum flavum*. Side of Titchfield river; near Hill Head.
 Nymphæa alba. Pond by Fontley Church.
5. *Papaver Rhœas*. Cornfields, common.
 Chelidonium majus. Boarhunt; North Fareham lane; Wallington.
1. *Glaucium luteum*. Hill Head shore.
 Fumaria officinalis. Near Roche court, &c.
 Coronopus Ruellii. Near Carns.
6. *Capsella Bursa-pastoris*. Very common.
 Lepidium campestre. Road to the monument; Gill copse, &c.
 Cochlearia anglica. The Salterns.
2. *Armoracia rusticana*. Ditch by Titchfield river.
 Cardamine pratensis. Near Place House; Fontley.
 —— *hirsuta*. Gill copse; Gudgeheath-lane.
 —— *amara*. By Titchfield river.
 Barbarea præcox. Down-lane.
 —— *vulgaris*. Fields, &c. near Gill copse; Boarhunt.
 Nasturtium officinale. Peel common.
 Sisymbrium officinale. Near Carns; Quay, &c.
 Erysimum Alliaria. Down-lane; Fontley-lane.
 Cheiranthus Cheiri. Portchester castle.
 Sinapis arvensis. Over the tunnel; cornfields.
 Brassica Napus. Fields and copse near White Dell.
1. *Draba verna*. Fontley iron-mills.
1. *Arabis Thaliana*. Ditto.
 Reseda lutea. Monument-hill; Portsdown chalk-pit.
 —— *luteola*. Maindell chalk-pit.
4. *Helianthemum vulgare*. Maindell chalk-pit; Nelson's monument.
 Viola canina. Down-lane; Gill copse, &c.
 —— *β pusilla*. Titchfield common.
 —— *tricolor*. Cornfields, common.
 —— *odorata*. Near Roche-court.
 Drosera longifolia. Millis's bottom; Titchfield common.
 —— *rotundifolia*. Titchfield common.

- Polygala vulgaris*. Maindell chalk-pit.
1. *Dianthus Armeria*. Wicor Hard.
Silene maritima. Wicor Hard.
 ——— *inflata*. Monument-hill ; Carns.
 5. *Lychnis vespertina*. Near Fareham common, &c.
 5. ——— *diurna*. Cattisfield ; Fontley.
 ——— *Flos-cuculi*. Rowner-lane ; near Titchfield.
 ——— *Githago*. Path to the monument ; field by Blind-lane.
 5. *Sagina procumbens*. Near Carns ; the Salterns.
Spergula arvensis. Blackbrook ; Wickham-road.
Monchia erecta. Titchfield common.
Arenaria trinervis. Southampton-road, beyond Titchfield.
 ——— *serpyllifolia*. Wallington ; Quay.
 5. ——— *marina*. Wicor Hard ; Salterns.
 5. *Stellaria holostea*. Monument-lane ; Uplands, &c.
 ——— *graminea*. Fareham common.
 6. ——— *media*. Very common.
Cerastium semidecandrum. Wicor Hard ; the Salterns.
 ——— *triviale*. Wallington ; by Titchfield river.
 ——— *glomeratum*. The Salterns ; Fontley iron-mills.
Linum catharticum. Monument-hill ; Maindell chalk-pit.
 1. ——— *angustifolium*. Near Cattisfield ; the Salterns.
Malva moschata. Fareham common ; Southampton-road ; near the Monument.
 6. ——— *sylvestris*. Common.
 ——— *rotundifolia*. Wallington ; Titchfield.
 2. *Althæa officinalis*. Hill Head.
Hypericum perforatum. Titchfield-road ; Uplands.
 ——— ——— *Æ. angustifolium*. Maindell chalk-pit ;
 Wicor Hard.
 ——— *hirsutum*. Maindell ; Monument-lane chalk-pit.
 ——— *elodes*. Titchfield common ; very abundant.
 1. ——— *Androsæmum*. Hill copse.
 ——— *humifusum*. Titchfield-road.
 ——— *pulchrum*. Titchfield common ; Southampton-road, beyond Titchfield.
 ——— *tetragonum*. Cattisfield.
- Acer campestre* and *Pseudo-platanus*. Boarhunt.
Geranium robertianum. Maindell ; Paxol-lane ; Cattisfield.
 ——— *molle*. Down-lane, &c.
 ——— *dissectum*. Very common.

1. *Erodium cicutarium*. Fontley iron-mills.
Oxalis Acetosella. Hill copse.
Euonymus europæus. Down-lane; North Fareham.
Rhamnus Frangula. Titchfield common; Fontley copse.
Spartium scoparium. Uplands; Monument-lane copse.
Ulex europæus and *nanus*. Fareham common.
Genista tinctoria. The Salterns; Wicor Hard.
Ononis arvensis. Monument-hill; Maindell chalk-pit.
5. *Anthyllis Vulneraria*. Ditto ditto.
6. *Medicago lupulina*. Very common.
Melilotus officinalis. Clay pit by Wallington pottery.
Trifolium procumbens. Titchfield-road, &c.
6. ——— *pratense* and *repens*. Fields; common.
———— *minus*. Fareham common; Salterns.
———— *fragiferum*. The Salterns.
———— *filiforme* and *subterraneum*. Titchfield common.
Lotus corniculatus. Maindell, &c.
———— *major*. Titchfield-road.
Onobrychis sativa. Fields by Down-lane.
Vicia Cracca. Wicor Hard; near Fareham common.
———— *sativa*. Gill copse; Redenham.
———— *sepium*. Gill copse; Paxol-lane; Fontley.
———— *hirsuta*. Wicor Hard.
———— *tetrasperma*. Salt marshes at Carns.
Lathyrus pratensis. Rowner-lane.
Orobis tuberosus. Gudgeheath-lane; Gill copse; Fontley.
Prunus spinosa. Very common.
———— *avium*. Titchfield common; Hill copse.
5. *Spiræa Ulmaria*. Maindell brook; Titchfield common, &c.
5. *Geum urbanum*. Near Place House; Gill copse, &c.
5. *Agrimonia Eupatoria*. Maindell chalk-pit, &c.
6. *Potentilla reptans* and *anserina*. Very common.
5. ——— *Fragariastrum*. Titchfield-road, &c.
———— *Tormentilla*. Fareham common; Titchfield common.
1. ——— *Comarum*. Titchfield common.
Fragaria vesca. Monument-lane; Titchfield common.
6. *Rubus fruticosus*. Very common.
6. *Rosa canina*. Very common.
———— *arvensis*. Titchfield and Gosport roads.
———— *inodora*. Titchfield-road.
———— *rubiginosa*. Titchfield common, side of Warsath-road.

- Poterium Sanguisorba*. Field by Down-lane; Titchfield-road.
Alchemilla arvensis. Cornfields near the workhouse.
6. *Cratægus Oxyacantha*. Hedges, very common.
Pyrus Malus. Near Nelson's monument.
1. — *communis*. Lane between Fareham tunnel and Cattisfield.
 1. — *aucuparia*. Titchfield common.
- Epilobium hirsutum*. Maindell brook, &c.
 — *montanum*. Uplands; copse by the gas-houses.
 — *parviflorum*. Cattisfield, &c.
 — *tetragonum*. Southampton-road.
- Circea lutetiana*. Hill copse; Cattisfield.
6. *Callitriche verna*. Common.
Myriophyllum spicatum. Ditch near Hill Head.
1. *Lythrum Salicaria*. Side of Titchfield river.
Peplis Portula. Pools near the Southampton-road, beyond Titchfield.
- Bryonia dioica*. The Salterns; Maindell.
Montia fontana. Titchfield common.
Scleranthus annuus. Titchfield common, by Southampton-road.
Sedum acre. Roofs at Fareham and Titchfield.
2. — *Anglicum*. Wicor Hard.
 — *reflexum*. Roof at Quay.
- Sempervivum tectorum*. Roof at Blackbrook turnpike.
Saxifraga tridactylites. Wall at Wallington; North Fareham.
Adoxa moschatellina. Boarhunt-lane.
Hedera Helix. Place House, &c.
Cornus sanguinea. Maindell; Porchester-road, &c.
Hydrocotyle vulgaris. Titchfield common.
Sanicula europæa. Down-lane.
Conium maculatum. Carns iron-mills.
2. *Smyrniolum Olusatrum*. Portchester Castle.
Apium graveolens. The Salterns; Bridge foot.
Helosciadium nodiflorum. Cattisfield.
Sison Anomum. The Salterns; near Carns; Wallington pottery.
Bunium flexuosum. Copse by the gas-house.
Pimpinella Saxifraga. Maindell chalk-pit; Carns.
4. *Cenanthe pimpinelloides* (L.). Stubbington; Newlands; Carns; the Salterns.
 — *Phellandrium*. Gill copse; Titchfield river; the Salterns.
Æthusa Cynapium. Waste ground.

- Silaus pratensis*. Uplands ; Carns.
Angelica sylvestris. Gill copse ; Fontley iron-mills.
Pastinaca sativa. Maindell chalk-pit ; near Nelson's monument.
Heracleum Sphondylium. Boarhunt ; Carns, &c.
Daucus Carota. Hill copse ; Maindell chalk-pit ; Portsdown.
Torilis nodosa. Titchfield Church-yard.
 ——— *infesta*. Cornfields near Carns.
 ——— *Anthriscus*. Titchfield-road.
Scandix Pecten. Cornfields by Gill copse.
Anthriscus sylvestris. Very common.
Chærophylllum temulentum. Near Fareham common, &c.
 2. *Bupleurum tenuissimum*. Wicor Hard.
Sambucus nigra. Common.
Viburnum Opulus. Maindell brook ; hedge at Crocker-hill.
Lonicera Periclymenum. Down-lane ; Titchfield-road.
Galium verum. Near Nelson's monument ; Maindell chalk-pit ; Carns.
 ——— *Mollugo* and *Aparine*. Common.
 ——— *cruciatum*. Fareham common ; near the monument.
 ——— *saxatile*. Titchfield common.
 ——— *palustre*. By the Southampton-road.
Sherardia arvensis. Cornfields near the tunnel ; Wicor Hard.
Asperula cynanchica. Maindell chalk-pit ; Down-lane ; Portsdown.
Valeriana officinalis. Bridge at Carns ; side of Titchfield river.
Fedia dentata. By Hill copse.
Dipsacus sylvestris. Wallington pottery ; Portchester - road ; Windmill-lane.
 ——— *pilosus*. North Fareham ; Mr. Robinson.
Scabiosa succisa. Fareham common ; Gudgeheath-lane.
 ——— *Columbaria*. Maindell chalk-pit.
Knautia arvensis. Maindell ; Paradise ; Nelson's monument.
Tragopogon minor. Boarhunt-lane.
 1. ——— *pratensis*. Wallington pottery.
Helminthia echioides. Portchester Castle ; Newlands ; the Salterns.
 3. *Picris hieracioides*. Maindell chalk-pit ; Portchester-road.
Leontodon hispidum. Boarhunt-lane ; Down-lane.
 ——— *autumnale*. The Salterns.
 ——— *hirtum*. Side of Wickham-road ; the Salterns.
Hypochaeris radicata. The Salterns ; Portsdown.

- Sonchus arvensis*. Fields near the tunnel; Carns.
6. ——— *oleraceus*. Too common.
6. *Crepis virens*. Wallington pottery; Wicor Hard, &c.
Hieracium Pilosella, sabaudum, umbellatum and *sylvaticum*.
 Fareham common.
6. *Taraxacum officinale*. Very common.
Lapsana communis. Titchfield-road; Cattisfield, &c.
Cichorium Intybus. Fontley; near Portchester.
Arctium Lappa. Wallington; Titchfield river, &c.
Serratula tinctoria. Copse near the tunnel.
Carduus nutans. Portsdown.
1. ——— *tenuiflorus*. Between Stubbington and Hill Head.
5. ——— *acaulis*. Uplands; Maindell; Portchester-road.
 ——— *pratensis*. Titchfield common.
6. ——— *arvensis*. Near the Tunnel, &c.
 ——— *palustris*. Near Fareham common; Peel common.
6. ——— *lanceolatus*. The Salterns, &c.
1. *Carlina vulgaris*. Maindell chalk-pit.
2. *Centaurea Calcitrapa*. Peel common; Portsdown.
 ——— *Scabiosa*. Monument-lane; Carns.
5. ——— *nigra*. Titchfield-road, &c.
 ——— ——— *β. radiata*. Portchester-road; Monument-lane.
Eupatorium cannabinum. Wallington; near old turnpike.
Artemisia maritima. Carns shore.
2. ——— ——— *β. gallica*. Between Carns and Wicor Hard.
 ——— *vulgaris*. North Fareham.
 ——— *Absinthium*. Fontley iron-mills.
- Gnaphalium uliginosum*. Butterwick-lane; Chark common.
 ——— *germanicum*. Titchfield; the Salterns; Portsdown.
- Tussilago Farfara*. Paxol-lane; Fontley.
- Erigeron acris*. Maindell chalk-pit; the Salterns.
- Aster Tripolium*. Wicor Hard; the Salterns.
4. ——— ——— *β. discoideus*. The Salterns.
Senecio vulgaris. Very common.
 ——— *aquaticus*. Marshes by Titchfield river.
 ——— *sylvaticus*. Southampton-road.
 ——— *Jacobæa*. Titchfield-road; Wallington pottery.
 ——— *tenuifolius*. The Salterns; Carns.
- Inula Conyza*. Maindell chalk-pit; Portchester-road.
1. ——— *crithmoides*. Wicor Hard.
5. *Pulicaria dysenterica*. Gosport-road, &c.

6. *Bellis perennis*. Everywhere.
5. *Chrysanthemum Leucanthemum*. Fields by Gill copse, &c.
2. *Matricaria Chamomilla*. Wicor Hard.
6. *Pyrethrum inodorum*. Common.
 —— *Parthenium*. Titchfield.
- Anthemis arvensis*. Near the tunnel.
 —— *nobilis*. Fareham common; Peel common, in profusion.
- Achillea Ptarmica*. Millis's bottom; Titchfield river.
 —— *Millefolium*. The Salterns; Cams, &c.
- Solidago Virgaurea*. Fareham common.
- Tanacetum vulgare*. By Windmill-lane.
- Campanula glomerata*. Maindell chalk-pit.
 —— *rotundifolia*. Portsdown; Maindell.
 —— *Trachelium*. Maindell; White dell.
 —— *patula*. Portsdown-hill; Mr. Robinson.
- Erica Tetralix*. Titchfield common; Millis's bottom.
5. — *cinerea*. Fareham common; Titchfield common.
5. *Calluna vulgaris*. Titchfield common.
 Ilex Aquifolium. Cattisfield.
5. *Ligustrum vulgare*. Maindell; Titchfield common.
 Fraxinus excelsior. Near the monument, &c.
 Vinca major. Stubbington.
1. *Gentiana Amarella*. Maindell chalk-pit.
 Erythraea Centaurium. Wicor Hard; the Salterns.
2. *Chlora perfoliata*. Maindell chalk-pit.
 Menyanthes trifoliata. Titchfield common.
6. *Convolvulus arvensis*. Very common.
5. — *sepium*. Maindell, &c.
1. *Cuscuta Epithymum*. Titchfield common.
1. *Hyoscyamus niger*. Stubbington.
 Solanum Dulcamara. Rowner-lane; Titchfield river, &c.
 —— *nigrum*. Portchester; Fareham.
- Verbascum Thapsus*. Maindell; Hill copse; White dell.
1. — *nigrum*. Fareham church-yard; Maindell.
6. *Veronica agrestis*, *hederifolia*, *Chamædryas* and *Beccabunga*.
 Common.
 —— *serpyllifolia*. Near Fareham common; Titchfield-road.
 —— *arvensis*. Walls at Wallington.
 —— *Anagallis*. Stubbington; Titchfield river.
 —— *officinalis*. Copse by the gas-house.

- Bartsia Odontites*. Maindell chalk-pit; fields by the Salterns.
Euphrasia officinalis. Maindell chalk-pit.
Rhinanthus Crista-galli. Meadows by Titchfield-river.
Melampyrum pratense. Copse by the gas-house.
Pedicularis palustris and *sylvatica*. Titchfield common.
Scrophularia nodosa. Near Cattisfield; Maindell.
 ——— *aquatica*. Rowner-lane.
Digitalis purpurea. Stubbington-road; Titchfield common.
Linaria Cymbalaria. Wallington.
 ——— *spuria*. Fields near the monument and the workhouse.
 ——— *Elatine*. Fields near the workhouse and Bedenham.
 ——— *vulgaris*. Maindell; hedge near Quay.
3. ——— *minor*. Near the tunnel; near Bedenham; sides of the railway.
 1. *Orobanche minor*. Clover fields near Monument-lane.
Verbena officinalis. Cattisfield; Maindell; Portsdown.
Salvia verbenaca. Near Fareham church-yard, 1842, 1843; destroyed 1844.
 2. *Lycopus europæus*. Place house; iron-mills; Titchfield common.
 2. *Mentha arvensis*. Butterwick-lane.
 ——— *aquatica*. Near Fareham common, &c.
 1. ——— *Pulegium*. Stubbington.
Thymus Serpyllum. Maindell; Monument-lane.
Origanum vulgare. Maindell chalk-pit; near the monument.
 1. *Calamintha officinalis*. Southampton-road, beyond Titchfield.
 ——— *Clinopodium*. Butterwick-lane, &c.
Teucrium Scorodonia. Southampton-road, beyond Titchfield.
 5. *Ajuga reptans*. Puxol-lane; Cattisfield, &c.
 ——— (*flore albo*). White dell.
 5. *Ballota nigra*. Cattisfield; Titchfield, &c.
Lamium Galeobdolon. White dell.
 6. ——— *album* and *purpureum*. Common.
 4. *Galeopsis Ladanum*. Over the tunnel; near Bedenham.
 ——— *Tetrahit*. Fields near the workhouse.
Stachys Betonica. Hill copse; Gudgeheath-lane, &c.
 ——— *palustris*. Fields between Puxol-lane and old turnpike; Blackbrook.
 6. ——— *sylvatica*. Very common.
 6. *Glechoma hederacea*. Titchfield-road, &c.
 6. *Prunella vulgaris*. Near Place house, &c.
Scutellaria minor. Titchfield common.

- Myosotis palustris*. Wallington; Maindell, &c.
 ——— *arvensis*. Down-lane, &c.
 ——— *versicolor*. Near Fareham common.
 ——— *collina*. Titchfield common.
Lithospermum arvense. Rowner-lane.
 ——— *officinale*. Near Fontley mill.
Symphytum officinale. Cattisfield; Titchfield river.
 ——— *β. patens*. Titchfield river; Fontley.
Borago officinalis. Portchester.
Echium vulgare. Maindell chalk-pit.
2. *Pinguicula lusitanica*. Titchfield common.
 1. *Utricularia minor*. Titchfield common.
 5. *Primula vulgaris*. Copses, common.
 1. ——— *β. caulescens*. White dell.
 ——— *veris*. White dell, &c.
 5. *Anagallis arvensis*. Bedenham, &c.
 ——— *tenella*. Titchfield common.
- Glaux maritima*. Shore near Cams; near Quay.
1. *Lysemachia Nummularia*. Side of Titchfield river.
- Samolus Valerandi*. Hill Head; Mr. Robinson.
Armeria maritima. The Salterns; shore from Cams to Wicor Hard.
- Statice Limonium*. The Salterns; Wicor Hard.
4. ——— *rariflora*. Shore at Cams; the Salterns.
 5. *Plantago major* and *media*. Common.
 6. ——— *lanceolata*. Too common.
 ——— *maritima*. Shore from Cams to Wicor Hard; the Salterns.
 ——— *Coronopus*. The Salterns.
- Chenopodium Bonus - Henricus*. Near Fareham church-yard; Rowner-lane.
1. ——— *ficifolium*. Ditch at Wallington, 1842.
 1. ——— *olidum*. Wallington.
 5. ——— *album*. Rowner-lane; Windmill-lane, &c.
 ——— *urbicum*, *β. intermedium*. Wallington.
 5. *Atriplex portulacoides*. Wicor Hard; the Salterns.
 5. ——— *littoralis*. The shore, everywhere.
 ——— *patula*. Waste ground.
- Beta maritima*. Shore from Cams to Wicor Hard.
5. *Schoberia maritima*. Everywhere on the shore.
 4. *Salicornia radicans* and *herbacea*. Shore at Cams; the Salterns.

1. *Polygonum Bistorta*. Near Gill copse.
 — *Persicaria*. Old Wickham-road ; Blackbrook.
 — *Lapathifolium*. Field near Fareham common.
5. — *Hydropiper*. Butterwick-lane ; Stubbington.
6. — *aviculare*. Very common.
5. — *Convolvulus*. Fields near the monument, &c.
Rumex Hydrolapathum. Titchfield river.
 — *obtusifolius*. Common.
 — *crispus* and *acutus*. Waste ground near Quay.
 — *pulcher*. Fields near the workhouse.
 — *acetosa*. Stubbington-road ; Titchfield marshes, &c.
 — *Acetosella*. Near the workhouse ; iron-mills, &c.
Daphne Laureola. Wood at Cams ; Down-lane chalk-pit.
2. *Thesium linophyllum*. Maindell chalk-pit.
Euphorbia Helioscopia. Waste ground and corn-fields.
 — *exigua*. Turnip-fields near Bedenham ; near the monument.
 — *Peplus*. Common.
 — *amygdaloides*. Near the tunnel ; copse by Monument-lane.
Mercurialis perennis. Down lane ; Gill copse, &c.
1. — *annua*. Church-lane.
Urtica dioica. Very common.
 — *urens*. Peel common ; Wallington.
Parietaria officinalis. Portchester castle ; Place house.
Humulus Lupulus. Gill copse ; Stubbington.
Quercus Robur. Maindell, &c.
Alnus glutinosa. Hill copse.
Carpinus Betulus. Titchfield common.
6. *Corylus Avellana*. Maindell ; White dell, &c.
Betula alba. Near Cams.
Myrica Gale. Titchfield common.
Salix repens. Titchfield common.
 — *triandra* (male). Maindell ; Titchfield common.
 — — (female). Fontley.
 — *Caprea*. Wickham-road.
 — *vitellina*. Fontley.
 — *acuminata* and *aurita*. Between the tunnel and Fontley.
 — *bicolor* ? Near Fontley iron-mills.
 — *alba*. Fontley.
 — *viminalis, rubra* and *aquatica*. Titchfield common.

- Salix decipiens*. Near Fontley iron-mills.
 — *undulata*. Titchfield-bridge.
Taxus Baccata. Cattisfield ; Fontley.
Spiranthes autumnalis. Lawn at Mr. Osborne's, (wild).
Listera ovata. Maindell chalk-pit.
Orchis mascula. White dell.
 — *maculata* and *pyramidalis*. Maindell chalk-pit.
 — *Morio*. Titchfield common.
Habenaria bifolia. Titchfield common.
Iris Pseud-acorus. Side of Titchfield river.
 — *foetidissima*. Fontley.
Narcissus pseudo-narcissus. Bridge-foot meadow ; Fontley.
Allium ursinum. Fontley ; bank near Wickham-road.
Hyacinthus non-scriptus. Gill copse ; White dell, &c.
Ruscus aculeatus. The Salterns ; Puxol-lane ; Gosport-road ;
 Hill copse.
Tamus communis. Uplands ; side of Titchfield river.
Alisma Plantago. Maindell ; Fontley ; side of Titchfield river.
 — *ranunculoides*. Titchfield common.
Triglochin maritimum. The Salterns.
Potamogeton densus. Cattisfield ; pond at Uplands ; Hill Head.
 — *plantagineus*. Titchfield common, in profusion.
 1. — *pectinatus*. Ditch at Hill Head.
 1. *Zannichellia palustris*. Ditch at Hill Head.
Lemna minor. Very common.
Zostera marina. Near Bridge foot.
Arum maculatum. The Salterns ; near Fareham common.
Sparganium simplex. Near Place house ; side of Titchfield river.
 — *ramosum*. North Fareham.
Typha latifolia. Cams, near the shore ; Fontley iron-mills.
Juncus conglomeratus. Rowner-lane ; the Salterns.
 — *effusus*. Near Fareham common ; the Salterns.
 — *glaucus*. The Salterns.
 4. — *maritimus*. The Salterns ; Hill Head ; Cams.
 — *acutiflorus*. Cattisfield ; Titchfield common.
 3. — *obtusiflorus*. By Titchfield river.
 — *supinus*. Titchfield common.
 — — β . Ditto.
 — *Gerardi*. The Salterns.
 — *bufonius*. Gill copse ; Southampton-road, beyond Titchfield.

- Luzula pilosa*. Roche-court ; copse by Down-lane.
 ——— *campestris*. The Salterns ; between the tunnel and Cattisfield.
 ——— *Forsteri*. Copse near White dell.
Narthecium ossifragum. Titchfield common.
Rhynchospora alba. Titchfield common.
Scirpus lacustris. Titchfield river.
 ——— *maritimus*. Cams shore ; Hill Head.
 ——— *palustris*. Stubbington.
 2. ——— *glaucus*. Ditch near Hill Head.
 ——— *Savii* ? Hill Head ; Mr. Robinson.
Eriophorum angustifolium. Titchfield common.
Carex præcox. Road between the tunnel and Cattisfield.
 ——— *pendula* and *sylvatica*. Gill copse.
 ——— *riparia*. Place house ; Fontley.
 ——— *divulsa* and *remota*. Titchfield-road ; Puxol-lane.
 ——— *vulpina*. The Salterns ; Titchfield-road.
 ——— *divisa*. Marshes near Hill Head, in abundance.
 ——— *recurva* and *ovalis*. Fareham common.
 ——— *pulicaris* and *pilulifera*. Titchfield common.
 1. ——— *strigosa*. Hill copse ; near Place house.
 ——— *hirta*. Road between the tunnel and Cattisfield.
 ——— *paludosa* and *acuta*. By Titchfield river.
 ——— *flava*, *panicea*, and *stellulata*. Titchfield common.
 ——— *binervis*. Near Hill Head.
 ——— *extensa*. Cams shore ; the Salterns.
 4. *Spartina stricta*. Cams shore.
Phalaris arundinacea. By Titchfield river.
Anthoxanthum odoratum. Fields, common.
Phleum pratense. Titchfield-road.
Alopecurus agrestis. Fields by Gill copse, &c.
 ——— *pratensis*. Common.
 ——— *geniculatus*. Ditch by Stubbington-road.
 1. *Gastidium lendigerum*. Fields near Blackbrook ; Maindell.
Agrostis vulgaris. Titchfield common, &c.
 ——— *alba*. Near the tunnel ; copse by the gas-house.
 ——— *setacea*. Titchfield common.
Arundo Phragmites. Titchfield common.
Aira cæpitosa. Wickham-road, &c.
 ——— *caryophyllæa*. The Salterns.
 ——— *præcox*. Titchfield common.

- Avena pubescens.* Monument-lane.
 ——— *flavescens.* The Salterns.
 ——— *elatior.* Fields by Down-lane.
Holcus lanatus. Fields by Gill copse, &c.
 ——— *mollis.* Cams.
Melica uniflora. Copse by gas-house; lane from the monument to Boarhunt.
Molinia cærulea. Titchfield common.
Koeleria cristata. Maindell chalk-pit.
Catabrosa aquatica. Side of Stubbington-road.
 3. *Glyceria aquatica.* Titchfield river.
 ——— *fluitans.* The Salterns; Stubbington; Titchfield.
 ——— *maritima* and *rigida.* The Salterns.
Poa annua. Everywhere.
 6. — *trivialis* and *pratensis.* Pastures in the Salterns.
 — *compressa.* The Salterns.
Briza media. Monument-lane; Maindell.
 6. *Cynosurus cristatus.* The Salterns, &c.
 6. *Dactylis glomerata.* Very common.
Festuca bromoides. Near the workhouse.
 5. ——— *duriuscula.* The Salterns.
 ——— *ovina*, *v. tenuifolia.* Fareham common.
Bromus giganteus. Gill copse.
 ——— *asper.* Lane from the monument to Boarhunt.
 6. ——— *sterilis* and *mollis.* Very common.
 ——— *commutatus.* Fields by Down-lane.
 6. *Brachypodium sylvaticum.* The Salterns; Titchfield-road.
 6. *Triticum repens.* Too common.
 4. ——— ——— *β. littorale.* Cams shore; the Salterns.
Lolium perenne. Very common.
 4. *Hordeum pratense.* The Salterns; Hill Head.
 ——— *murinum.* Quay.
 ——— *maritimum.* Cams.
Nardus stricta. Titchfield common.
Rottboellia incurvata. Wicor Hard; the Salterns.
 1. *Ceterach officinarum.* On a tomb in Fareham church-yard.
Polypodium vulgare. The Salterns; Fareham common.
 3. *Polystichum lobatum.* The Salterns; north Fareham.
 5. ——— *angulare.* Stubbington; Uplands; Cattisfield, &c.
Lastræa Filix-mas. Gill copse.
 1. *Athyrium Filix-fœmina.* Titchfield common.

Asplenium Adiantum-nigrum. Cattisfield.

———— *Ruta-muraria*. Bridge foot.

Scolopendrium vulgare. Place house; Fontley.

———— ——— *β. undulatum*. Place house.

Blechnum boreale. Titchfield common.

Pteris aquilina. Very common.

Osmunda regalis. Titchfield common.

Equisetum Telmateia. Gill copse; Fontley.

———— *arvense*. Near Gill copse; near the tunnel.

———— *limosum*. By Titchfield river.

SUMMARY.

SPECIES.		SPECIES.		SPECIES.	
Ranunculaceæ	15	Brought up	146	Brought up	337
Nymphaeaceæ	1	Illecebraceæ	1	Primulaceæ	7
Papaveraceæ	4	Crassulaceæ	4	Plumbaginaceæ	3
Cruciferae	18	Saxifragaceæ	2	Plantaginaceæ	5
Resedaceæ	2	Araliaceæ	1	Chenopodiaceæ	13
Cistaceæ	1	Cornaceæ	1	Polygonaceæ	13
Violaceæ	3	Umbelliferae	24	Thymelaeaceæ	1
Droseraceæ	2	Caprifoliaceæ	3	Santalaceæ	1
Polygalaceæ	1	Rubiaceæ	8	Euphorbiaceæ	6
Caryophyllaceæ	19	Valerianaceæ	2	Urticaceæ	4
Linaceæ	2	Dipsacæ	5	Amentiferae	19
Malvaceæ	4	Compositæ	59	Coniferae	1
Hypericaceæ	7	Campanulaceæ	4	Orchidaceæ	7
Aceraceæ	2	Ericaceæ	3	Iridaceæ	2
Geraniaceæ	4	Illicaceæ	1	Amaryllidaceæ	1
Oxalidaceæ	1	Jasminaceæ	2	Liliaceæ	3
Celastraceæ	1	Apocynaceæ	1	Tamaceæ	1
Rhamnaceæ	1	Gentianaceæ	4	Alismaceæ	3
Leguminosæ	25	Convolvulaceæ	3	Fluviales	6
Rosaceæ	22	Solanaceæ	3	Araceæ	4
Onagraceæ	5	Scrophulariaceæ	24	Juncaceæ	13
Haloragaceæ	2	Orobanchaceæ	1	Cyperaceæ	28
Lythraceæ	2	Labiatae	24	Graminaceæ	51
Cucurbitaceæ	1	Boraginaceæ	9	Filices	12
Portulacæ	1	Pinguiculaceæ	2	Pteroides	3
Carried up	146	Carried up	337	Total species ...	544
Natural orders	73.	Species	544.	Varieties	13.

Fareham, Oct. 12, 1844.

W. L. NOTCUTT.

Report of an experiment which bears upon the specific identity of the Cowslip and Primrose. By HEWETT C. WATSON, Esq., F.L.S.

WHILE the botanists of this country were still imperfectly acquainted with the true *Primula elatior* (of Jacquin), and were applying that name to varieties of the *Primula vulgaris*, I called the attention of the Botanical Society to one of those varieties which differed from the ordinary form of *P. vulgaris*, not only by having the umbel of flowers raised above the leaves on an elongated scape (a variation of character not rare in *P. vulgaris*), but also by approaching nearer towards *P. veris* in the size and colour of its flowers, the pubescence and other characters. This is the variety which is entered in the London Catalogue, under the name of *Primula vulgaris var. intermedia*, and which has been alluded to in the pages of the 'Phytologist' on different occasions (Phytol. i. pp. 9, 232, 1002), under the name of the "Claygate Oxlip." It has also been distributed by the Botanical Society, under the name of "Oxlip, No. 2," in contrast with other forms of *Primulæ* which are designated "Oxlips" also.

A wild root of this Claygate oxlip was removed to my garden in the spring of 1841. Neither in that year, nor during the three succeeding years, did I observe any seedlings about the plant. In the summer of 1843, I saved some of the seed, all from the one plant, in order to ascertain whether it would germinate. This seed was sown in a flower-pot, in the spring of 1844, and kept well watered. Numerous plants thus raised, were removed to the open ground in the autumn of 1844. On the 2d of May, 1845, there were eighty-eight of these plants alive; seventy of them then being in flower. Several were in no wise distinguishable from the common primrose; some few were perfect cowslips; the greater number being intermediate varieties, which might fairly be said to connect the cowslips and primroses, step by step, so gradually did these varieties pass one to the other. On throwing them into groups, to correspond with the arrangement given in the 'London Catalogue of British Plants,' I obtained the following numerical results:—

True cowslips (<i>Primula veris</i>)	4
Cowslips passing to oxlips (<i>P. veris</i> , <i>var. major</i>)	5
Oxlips (<i>P. vulgaris</i> , <i>var. intermedia</i>)	23
Caulescent primroses (<i>P. vulgaris var. caulescens</i>)	18
True primroses (<i>P. vulgaris</i>)	20
Plants not bearing flowers	18
	<hr/> 88

The Claygate oxlip, the parent plant, was growing in my kitchen garden, in which neither cowslip nor primrose was grown in 1843. Nor was it easy to conceive the parent plant fertilized from either of the two species, unless through the agency of bees. Under the circumstances of the experiment, though not impossible, I think it highly improbable, that the seed of any other *Primula* than the one plant, could have been in the flower-pot. When the young plants were removed to the open ground, they were set in four different places, in order to try them in dissimilar soils and situations. Among those placed most in the shade there were no "cowslips," or "cowslips passing to oxlips." This circumstance might be attributable to the paucity of plants so placed: the cowslips bearing a small proportion among the plants placed more in the sun. The conclusion appears unavoidable to me, that a variety of the primrose gave origin at the same time to cowslips, to primroses, and to many varieties of these two reputed species. All the flowers had the colours of the wild cowslip or primrose, or intermediate tints; and in other respects, they kept to the characters of the wild plants, without sporting into the monstrosities of calyx or corolla, which are so frequently seen in the garden *Primulæ*.

It will be observed of this experiment, that the first change from *P. vulgaris* was made (so to write) by the hand of Nature; the parent stock of my mixed assemblage having been a wild variety (as I suppose) of the primrose. In the experiment of the Rev. W. Herbert, somewhat similar results are said to have been produced by sowing the seeds of a "red cowslip,"—query, an oxlip? In recording his own experiment, it is stated by the Rev. J. S. Henslow that he sowed the seeds of "some cowslips" which were growing in his garden, and that these produced varieties intermediate between the cowslip and primrose, with one "perfect primrose." Remarkably enough, no cowslip appears to have been produced from the seeds sown by Mr. Henslow; and I cannot avoid a still lingering doubt whether the seeds may not inadvertently have been taken from plants of the oxlip or caulescent primrose, instead of the cowslip. Moreover, it is now desirable to ascertain whether the "Westhoe" oxlips are not referrible to the *Primula elatior* of Jacquin, and, equally so with the garden cowslips from which the seeds were collected. In the few following remarks, which naturally arise on these experiments, I assume the accuracy of my own experiment, as before reported; although a repetition of it is rendered desirable on account of the admitted possibility that a seed or seeds of another *Primula*

could have been in the soil used in the flower-pot. But whence the connecting series of varieties in that case?

According to the technical idea of a species, which makes it embrace all individual examples which have (or might have) descended from a common progenitor, all my plants—whether cowslips, primroses, or varieties of either—must belong to one single species; and thus we fall back upon the Linnean notion of one "*Primula veris*," with its subordinate varieties of "*elatior*" and "*acaulis*." This view will scarce find favour in the eyes of those botanists who labour under the "species-splitting" monomania. The wild cowslip and primrose have well-marked characters for distinction, and characters which are usually very regular and constant. So far they are now dissimilar, and more constantly dissimilar, than are numerous pairs of "book-species," which are unhesitatingly received as really distinct in nature. Unite plants so dissimilar and so readily distinguished, as are the cowslip and primrose,—and what are we then to say about the frivolous attempts at species-making among the *Rubi* and *Polygona* in vogue at present, as among the *Rosæ* and *Menthæ* in former years?

If we allow the cowslip and primrose to be two species, and yet allow that one can pass into the other, either directly or through the intermediate oxlip, we abandon the definition of species, as usually given, and fall into the transition-of-species theory, advocated in the '*Vestiges*.'

I do not see that we get more clear of the difficulty by assuming, without proof thereof, that the "Claygate oxlip" is a true example of hybridity. Do hybrids, if fertile, produce at once their own like, the like of each parent, and a progeny of intermediate likeness also? At best, the hybrid is only half of either species,—and can the half produce the whole? Such an event would assuredly not be "like producing like" through an endless succession of descents?

Let a few other cases be adduced, between reputed species equally dissimilar, and we shall be forced to recast our ideas and definition of the term "species." It would unavoidably become arbitrary and conventional; with no more exactness or constancy of application, than we can give to the terms "genus" or "order."

HEWETT C. WATSON.

Thames Ditton, June 18, 1845.

Memoranda of certain plants collected at Hurstperpoint in Sussex.

By WILLIAM MITTEN, Esq.

Myosotis stricta.—A plant possessing several characters in accordance with the descriptions of *Myosotis stricta*, *Link*, occurs in several places. It was first observed on a sandy bank in company with *M. versicolor* and *M. collina*, from both which it may be readily distinguished by its flowers commencing at the base of the stem, below several of the leaves, and the calyx not spreading as in *collina*; the flowers are paler and rather smaller; in *M. collina* the flowers appear perfect when erect, while in my plant they are fully blown on the curled portion of the raceme, and by the time they arrive in the erect position are withered. I have not been able to detect the hooked hairs in the living plant, but when dry they are curved in various directions. I have observed this plant for some time, and find no forms approaching either *M. versicolor* or *M. collina*. I shall be happy to submit my specimens to a comparison with continental specimens of *Myosotis stricta*, *Link*.

Cinclidotus riparius, *Arnott*, var. β . *terrestris*, acrocarpous, peristome and leaves exactly corresponding in structure with those of *C. fontinaloides*, on stumps of trees in a rivulet.

Phascum alternifolium, *Bruch et Schimper*, in many places.

Tortula latifolia, *Bruch*, on posts and about the roots of trees; subject at times to inundation, but always exposed to the light.

Tortula squarrosa, *De Notaris*, on the downs, near: associated with *Didymodon flexicaulis*.

WM. MITTEN.

June 13, 1845.

Occurrence of Alyssum calycinum near Epping.

By EDWARD NEWMAN.

MR. HENRY DOUBLEDAY informs me that *Alyssum calycinum*, a plant well known as a native of Europe, has been found several times by Mr. John Ray in the vicinity of Epping. It occurs in corn-fields, and Mr. Doubleday considers that, in all probability, it has been introduced, like many other plants, in foreign seed.

EDWARD NEWMAN.

Devonshire-street, June 20, 1845.

Notice of the 'London Journal of Botany.' No. 41, May, and No. 42, June, 1845. -

The May number contains—

'Botanical Information,' continued from April.

'Lindley's Vegetable Kingdom,' being an announcement of a third edition of Dr. Lindley's 'Natural System of Botany, or a Systematic View of the Organization, Natural Affinities, and Geographical Distribution of the whole Vegetable Kingdom.' The editor of the 'Journal' says it "will be in reality a new work."

'Algæ Antarcticæ, being characters and descriptions of the hitherto unpublished species of Algæ, discovered in Lord Auckland's group, Campbell's Island, Kerguelen's Land, Falkland Islands, Cape Horn and other southern circumpolar regions, during the Voyages of H.M. discovery ships Erebus and Terror,' by Dr. J. D. Hooker, and W. H. Harvey, Esq., M.D.

'On six species of *Jungermanniæ*, new to Britain,' by Thomas Taylor, M.D.

It seems that for this important addition to the British Flora we are indebted to the acuteness and sagacity of the late Mr. Thomas Drummond; all the species were found in the Highlands of Scotland. "They occur among other cryptogamic discoveries of the same individual in the extensive and most valuable collection of Sir William Hooker." The species are

1. *J. (Scapania) uliginosa*. *Nees, Hep.* p. 67.

Distinguished from *Scapania nemorosa*, *Nees*, and *S. undata*, *Nees*, "by the constantly entire leaves, and by the far less ratio of their smaller to their greater lobes, as well as by its more aquatic habitat."

2. *J. (Scapania) subalpina*, *Nees*, *β. undulifolia*, *Synops. Hep.* p. 64.

Dr. Drummond having examined the fructification makes the following addition to the character given in *Nees' Synopsis*, "Calyx much longer than the perichætium, obovate, compressed, truncate, denticulate, with a narrow base."

3. *J. Schraderi*, *Mart. Flor. Erlang. Crypt.*, p. 180, t. 6, f. 55. *J. autumnalis*, *Decand. Flor. Franc.* t. 5, p. 202.

This species is well known as an inhabitant of Europe from Portugal to the north of Germany: it occurs also in America from Canada to New York.

4. *J. Zeyheri*, *Hübner, Hep. Germ.* p. 89, n. 25, *Synops. Hepat.* p. 96.

This species greatly resembles the *J. cordifolia* of Hooker ; but the more patent and shorter leaves give it a squarrose appearance, not observable in *cordifolia*.

5. *J. gelida*, *Taylor*. Stem creeping, ascendant, subsimple, flexuous ; leaves approximate, erecto-patent, secund, subrotund, bifid, the segments unequal, somewhat acute, incurved, very entire.

It creeps up here and there among the *Gymnomitrium concinnum* of Nees, overtopping it and then reclining : the colour of the upper part is reddish brown, but that of the lower, older, and more shaded parts is quite discharged ; stems slender, an inch long, consisting of the growth of former seasons, topped by that of the present year. Except near the top it is attached by rootlets throughout its length. The leaves are convex and largely cellular, the sinus between the segments sometimes acute, more commonly obtuse. It is allied, especially in the colour of its shoots, to *J. punicea*, *Nees*, an inhabitant of Java, but is a larger and less branched plant.

6. *J. Kunzeana*, *Hübner*. *Hep. Germ.*, p. 115, n. 88 ; *Synops. Hepat.* p. 112.

Patches dense, olive brown ; stems about one inch long, sparingly branched ; the entire inferior side has thickly-set rootlets. Leaves crossing the stem, concave, all pointing upwards ; some near the top trifid. Lateral perichæatial leaves quadrifid, the stipular bifid, all with a few spinous teeth at the base. Calyx convex above, deeply channelled below. Peduncle, four times as long as the calyx. Capsule oblongo-ovate.

‘Scientific Excursions in New Holland, by Dr. Ludwig Leichhardt, 1842-44. Extracted from his letters to M. G. Durand, of Paris.’

No. 42 contains the following papers :—

‘Description of *Podaxon Pistillaris*, Fries ; by the Rev. M. J. Berkeley, M.A., F.L.S.’

‘*Algæ Antarcticæ*, &c.’

‘*Decades of Fungi*,’ by the Rev. M. J. Berkeley, M.A., F.L.S.

‘On a minute Fungus, *Podisoma macropus*, growing on *Juniperus Virginiana* in North America, by Dr. Wyman, in a letter addressed to Sir W. J. Hooker ; with some additional remarks by the Rev. M. J. Berkeley.’

‘Contributions to the Botany of South America,’ by John Miers, Esq., F.R.S., F.L.S.

Notice of the Annals and Magazine of Natural History, No. 100,
June, 1845.

THIS number contains three botanical papers.

'A Century of new Genera and species of Orchidaceous Plants, characterized by Professor Lindley.'

'On a monstrosity of *Gentiana campestris*. By G. Dickie, M.D., Lecturer on Botany in the University and King's College of Aberdeen.'

'On the British *Desmidiæ*. By John Ralfs, Esq., M.R.C.S., Penzance.'

Dr. Dickie's paper describes certain malformations in the flowers of *Gentiana campestris*, which occurred growing in almost pure sand near the sea at Aberdeen. The calyx presented the usual number and arrangement of parts; the corolla was mostly natural, but sometimes 5-cleft; stamens four, sometimes more, in most cases partially or entirely petaloid; these three whorls, sepals, petals and stamens, presenting the usual relation to each other. The greatest deviation from the natural structure occurred in the pistil, which, in many instances, was represented by flower-buds, extending, in one instance, to eight, in another to six, five of them forming a whorl round a central bud; and sometimes ovaries, nearly natural, were intermixed with flower-buds.

Dr. Dickie gives a table showing the number of divisions of corolla, number of stamens and number of flower-buds representing the pistil, as they occurred in ten specimens. The ninth of these contained six flower-buds, five forming a regular whorl, and the sixth occupying the centre of each. Of these buds he gives a detailed description as under:

No. 1. Calyx none; corolla of ten petals; stamens ten, alternate with the petals; the place of the ovary was occupied by two flower-buds, each with single perianth, imperfect stamens and one ovary in each.

No. 2. Sepals five; petals eight; stamens ten, in two whorls; ovaries two, almost natural.

No. 3. Sepals three; petals three; stamens three, alternate with the petals; ovary of three carpellary leaves with six rows of ovules.

No. 4. Sepals five, an ovary adhering to the outside of one; petals five; stamens five, alternate with the petals; ovary of five carpellary leaves, with ten rows of ovules.

No. 5. Sepals three; corollæ two, each of three petals; stamens three; ovary single.

No. 6. The central flower; calyx none; corolla 5-cleft; stamens five, petaloid; ovary of three carpellary leaves; ovules in six rows.

"In the tenth flower the centre was occupied by three ovaries and two small flower-buds. One of the ovaries was much compressed, two carpellary leaves open half way, its ovules perfect; another of the same size and structure enclosed one like itself, the ovules imperfect." A few other deviations are recorded, and the author continues: "I would particularly allude to the changes which the ovarium and ovules present, and the inferences which may be drawn from these. A simple ovarium is considered to be a modified leaf folded upon itself, the margins united, and these alone, in most cases, constituting the placenta (necessarily double), and producing ovules. It was at the same time supposed that the stigma was a mere prolongation of the midrib of the carpellary leaf, and, therefore, single and terminal. The greatest botanist of this or any other age, has satisfactorily demonstrated that each simple pistillum or carpel has necessarily two stigmata, which are to be regarded not as terminal, but lateral; the style where present being only a mere attenuation, in many cases very gradual, of the whole body of the ovarium. Most Gramineæ, many Euphorbiaceæ, several Irideæ, &c., are stated as illustrating this point. The ovaria, in some of the monstrous flowers already described, appeared to afford proof of the same, and many carpels in the earlier stages of their development, yield ample evidence that the opinion alluded to is in strict accordance with nature."

After alluding to observations of Professor Henslow, on the transformation of the ovules of *mignonette* into leaves, and those of M. Brogniart on a monstrosity of *Delphinium elatum*, Dr. Dickie dissents in some degree from the opinions of the last-named botanist. "From careful examination I have been convinced that in some carpels, whose ovules are numerous, the order of development is from the base to the apex. In very early stages of the carpel, the ovules are confined to the lower part alone, there being no trace of them towards the upper part of the placenta. At a more advanced stage they occur throughout a greater portion of its extent, but still there is a very evident difference, previous to impregnation, between the progress made by ovules from the base of a placenta, and those nearer to its apex; this is obvious to the unassisted eye in regard to the development of the membranes, but actual measurement removes all doubt."

On the Theory of 'Progressive Development,' applied in explanation of the Origin and Transmutation of Species. BY
HEWETT C. WATSON, Esq., F.L.S.

(Concluded from page 168).

MY former communications upon this subject (Phytol. for April, May and June) shortly stated the theory of 'Progressive Development,' as set forth in a work lately published under the title of 'Vestiges of the Natural History of Creation.' And I endeavoured to supply a botanical deficiency in that work, by adducing some examples of the facts and arguments bearing upon the question, which might be drawn from phytological investigations. It is now proposed to bring the question within narrower limits, by adverting to the conclusions which are suggested by the facts before mentioned. I am informed that the author of the 'Vestiges' has much modified his views in the later editions of his volume. If so, it is of little consequence to my present object. The idea of progressive development was not his own, except by adoption; nor, as I think, did it derive the support of a single additional fact from the work in question. The merit of the volume consisted in its well-told and well-arranged assemblage of known facts, not in any novelty of ideas or novelty of facts. The author had read rather than observed, had speculated rather than experimented; and hence, while he may have popularised and diffused his subject, he can scarcely be held to have advanced it in any way, as a question of science or philosophy. His mere opinions, apart from facts, are of no value, and may change with each edition.

The conclusion, that "like produces like," through an indefinite series of generations, seems almost inevitable to the botanist, whose range of observation takes in only the natural course of events during the quarter of a century, more or less, which comprehends the period of vigorous mental power in a single individual. The same conclusion must still appear sound, although we extend the range of observation, by comparing living plants of the present year, with careful descriptions, pictorial representations, or dried specimens of those which lived a hundred years ago. Still the same conclusion must be drawn, when we compare a young oak or chestnut with old trees of their kind which have existed through centuries past.

Thus far, the resemblance between the past and the present, in the vegetable world, is sufficiently close and certain to warrant a conclusion that plants repeat their own images by hereditary descent through a long series of years, to which we can assign no limit.

These images, it is true, are not always perfect likenesses. *Varia-*

tions of climate and soil, or of other conditions, are accompanied by corresponding variations in the plants. But, limiting the period of our observation, as above, these variations are usually found to be temporary ; so that we may say, there is a standard or average type for each kind, which is repeated in the individual plants as nearly as internal health and external conditions will allow. This supposed standard or average I will here express by the term 'central type.' The central type will thus be nearly synonymous with the proper metaphysical notion of a species, apart from its varieties. It is usually this same central type which is described in the specific character of a plant; although occasionally authors endeavour so to form their specific characters, that these shall include all varieties of the species as well as the central type.

Individual plants which differ from the central type are designated "varieties." Among varieties we may include all the plants which are marked by any obvious difference, ranging from the more trifling variations of colour or size, to those which are so wide as to raise a question whether the plants really belong to the same central type or species.

Varieties appear to be less permanent than the central types from which they originate. A tendency to change again is usually observed in the descendants of such varieties; and the further change is frequently in a reversed direction, or back towards the central type. Among plants in a wild state, the tendency to keep or to resume the central type commonly seems to be greater than the tendency to vary from it. Hence there is an appearance of permanence in species, as though each kind had a limit to its power of change, beyond which its descendants can never pass in a direction aberrant from the central type, and from which limit there is a tendency to return to that type.

But all this, be it remembered, refers to a very restricted period in the history of our globe. It is that space of time only, the events of which are most clearly seen and understood by botanists. And it is so very short a space, comparatively with the spaces which come into the estimates of geologists, that we can scarcely deem an inappreciable change of the central type, during that short space, to be sufficiently conclusive proof against the gradual transition of species during spaces of time immeasurably more extended.

Moreover, we must avoid the straining of our fact beyond its true bearings. Though the central types of certain species may have remained the same during some scores or centuries of years, this one fact cannot negative a possibility that there are also varieties of the same or of other species which, during the same time, have gradually

become more and more unlike their respective central types; until, through diminished likeness, they may now actually be referred to different central types,—that is, may be described as distinct species.

Further, it is to be kept in memory, that when it becomes man's interest or pleasure to extend the variations of plants from their central types, he can effect this desired result much more rapidly and widely than is seen to occur amongst plants in a state of nature. By taking the more decided varieties as parents of a fresh stock, through several successive generations, and so gradually rendering them more and more unlike the central type, we appear to weaken their tendency to resume that type. Hitherto, no limit has been ascertained to this power of changing plants by varying varieties. Some of the species which have been long subjected to this process, have been run into varieties so widely different from their known or supposed central types, that if any botanist had first found their extreme forms in a newly explored country, he would assuredly have believed them to belong to different central types—to be totally distinct species.

In this, as in every other such process, man works only with the powers of nature. Although brought about immediately through his instrumentality, the changes effected in the plants are simply the natural results of those conditions to which he subjects them. There seems no reason to suppose that the same result which man brings about more rapidly, could not have been brought about, though more gradually, without his interference. If man can produce hereditary varieties of plants, which remain permanently different from their central types, under his care, why cannot nature also produce such hereditary varieties? And in what respect does an hereditary variety, the origin of which is unknown, differ from a species?

Looking to present events in nature, and to results produced by the interfering agency of man, the following conclusions seem reasonable:—

1st.—The central type of a species is reproduced and remains the same through many successive generations.

2ndly.—Nevertheless, individual plants do occasionally differ more or less widely from their central type, and thus become varieties.

3rdly.—The descendants of varieties frequently revert to the central type of the species from which those varieties originated. But we cannot show that all varieties eventually do thus revert.

4thly.—The effects of cultivation, in rendering varieties more different, and perhaps more permanently different, from their central types, together with the occurrence of hereditary varieties among wild plants,

give plausibility to the supposition that varieties do not always revert to the central types of the species from which they originated.

5thly.—A variety (if such there be) in which the tendency to reproduce its own like has superseded the tendency to revert to the central type of the original species, would possess the essential character of a species in itself,—namely, its own distinct and permanent central type. It has not yet been proved that any such variety exists, neither can it be disproved.

6thly.—The discordant opinions of botanists, as to which plants are species and which are varieties only—the occurrence of varieties intermediate between presumed species—the power of changing from the central type into varieties, and back again to the central type—the tendency of some varieties to become hereditary, probably in obedience to the law of ‘like producing like’—with other facts, point towards the conclusion that varieties may gradually become species; although these facts are far from sufficient to establish that conclusion.

On the whole, therefore, we seem to be justified in asserting, that our knowledge of the present events in nature, taken by itself, should incline us to a conclusion which is directly adverse to the theory of “progressive development” or “transition of species;” yet without affording us any actual disproof of that theory.

It is otherwise when our range of thought embraces the vastly wider space of time, the events of which are investigated by geologists. There we find ample evidence to justify the conclusion that different species succeeded to each other. And no better mode of accounting for this succession has been suggested, than the hypothesis that one species passed into another, under changing external conditions. Supposing this transition of species to have taken place very gradually, and through a very long series of descents, it would not require more rapid change (from central types into varieties, and from a less variety into a greater) than we see actually occurring in the production of varieties at the present period of the earth’s history.

Could we ascertain that some varieties will continue to vary from their central type, through many successive descents; and that, as they become less similar to their original central type, the tendency of “like to produce like” will overpower and supersede the tendency to revert to the original type;—in this case, we might hold the “transition of species” to be a theory founded on facts. At present, it is scarcely more than a plausible hypothesis, invented to account for facts, and accounting for them better than any other hypothetical suggestion has done.

HEWETT C. WATSON.

Thames Ditton, July 2, 1845.

Notes on Structural Botany. BY WILLIAM WILSON, Esq.

ANATROPOUS OVULE; WHAT IS IT?—If any of the readers of the ‘Phytologist’ have had the same difficulty in understanding this term that I have experienced, they will not regard the following remarks as superfluous. My reasons for supposing them of importance, and my excuse for certain crude observations which appear in my “Researches in Embryogeny” (Phytol. i. 734), will appear in the following quotations from a work which furnishes but few occasions for criticism, and is therefore the more likely to inspire implicit confidence in the accuracy and perspicuity of all its statements. I allude to Professor Lindley’s ‘Introduction to Botany.’

In reference to the anatropous class of ovules, he states that the “axis remains rectilinear; but one of the sides grows rapidly, while the opposite side does not grow at all, so that the [forameniferous] point of the ovule is gradually pushed round to the base; while the base of the nucleus is removed from the hilum [point of attachment of the ovule to the funiculus or placenta] to the opposite extremity.—When the base of the nucleus is thus removed from the base of the ovule, a communication between the two is always maintained by means of a vascular cord called the *raphe*. This raphe, which originates in the placenta, runs up one side of the ovule until it reaches the base of the nucleus; and there expands into a sort of vascular disk, which is called the *chalaza*.”—(Ed. 2, p. 180).

I would first remark on the vagueness of this definition in reference to the time when the assumed change of position of the nucleus commences, and especially to the time of its completion. An explanation on this point is indeed given with Pl. 5, but was overlooked by me until very recently.

Secondly, the definition implies that it is only the nucleus which makes *culbutes*, and that the two integuments remain, *as to their base*, quite stationary, the inevitable inference being that the raphe or vascular cord of connexion is *within* the secundine and primine. This to me has been a grievous stumbling-block, and I have repeatedly sought for such a proof of locomotion on the part of the nucule, but always in vain. Foiled in my endeavours to detect an internal raphe, I began to doubt the propriety of the term *anatropous*.

Mr. Bentham (whose merit and profound science as a botanist need no acknowledgment from me) appears to have had some difficulty in adjusting his correct idea of this modification of an ovule to the conventional term used to express it. He says of the *Leguminosæ*

(in the 'London Journal of Botany,' iii. 130) that the "ovule is essentially anatropous, that is to say, the *chalaza* is separated from the *hilum* by a *raphe* of greater or less length, and the foramen is brought down to near the hilum," but he does not observe upon the fact that in every instance of an anatropous ovule, the *chalaza* and *raphe* are both external with regard to the primine and secundine.

If we suppose an *orthotropous* ovule (that is, one in which the base is really the lowest point as to position, and the foramen at the top) standing at first upright upon a funiculus of its own length, and afterwards the apex of the ovule (primine, secundine and all) turned down so as to touch the base of the funiculus, and the funiculus itself brought into a state of intimate adhesion throughout its whole length with the surface of the primine, we shall have a correct representation of the actual structure and appearance of an anatropous ovule at the period of fecundation. Would it not therefore be more correct, and more in harmony with the original use of the term *hilum*, to consider the apex of the adhering funiculus the real point of attachment between the funiculus and the ovule?

The fact appears to be, that the primine, secundine and nucleus have invariably one common point of junction: any thing asserted to the contrary depends solely on the technical (and in this case mischievous) employment of the term base. Had the foramen of the ovule always been fixed upon as indicating the apex of the ovule and the opposite extremity the base (except in those cases where the nucleus is bent or doubled), the confusion evident in the present definition would have been avoided, and the term *anatropous*, independent almost of any theory on the subject, would have been unobjectionable; at present, it expresses what to me appears a false view of the actual growth and development of the ovule. The illustrations in Lindley's work at Plate V, figs. 18, 19 and 20, are probably imaginary, and not from nature: but even admitting them to be accurate representations, they do not, in the points here commented upon, support the definition. I have never been able to find a period when the ovule, if cognisable at all, had not already assumed the anatropous state.

To prevent any misconception of my meaning, I would here define a *raphe* as an *adherent funiculus*, embracing a portion of the ovule; and I propose that in future, the extremity of the raphe most remote from the placenta be considered the true base of the ovule; that being the real point of junction, as indicated by the line of vascular tissue within the raphe.

Spines.—Professor Lindley defines a spine as “the imperfect evolution of a leaf-bud, and therefore a branch.” That some branches may be checked in their growth so as to be changed into spines, I will not deny; but the usual development of spines is not in accordance with this view. They are found on the shoots of the current year, and occupy (*as to time* as well as position) the place of a leaf-bud; in other words, they appear one year sooner than a branch, under ordinary circumstances, can be developed at that point.

Nettle Stings.—The extremity of the sting is at first hermetically closed up by a small globular button, not unlike the button of a fencing-foil, but placed obliquely, so that the slightest touch breaks it off, when the sharp extremity of the tubular sting enters the skin, and pours into the wound the venomous juice lodged in the spongy elastic receptacle at the base of the sting. If a nettle leaf be grasped with violence, the hand is seldom injured; owing to the fracture of the sting itself, which cannot puncture the skin after its fine point has been turned aside or broken off.

Spiral Vessels on the Seeds of Collomia, &c.—Those who have not examined them will be much gratified by placing thin slices of the seeds, one at a time, under a microscope of moderate power, and observing the effect which immediately ensues when a drop of water is added; but they will be still more interested with the serpent-like movements of similar vessels in the *achenia* of *Salvia*. If an unripe berry of the mistletoe be examined under a microscope, a portion of the internal viscous substance lying nearest to the seed will be found to exhibit traces of similar spirals. May not the economy of all these be the same?

Anthers of Viscum album.—I know of no analogous structure in other plants: the anther is not valvular, and adheres, without any filament, to the surface of the petal. The pollen is contained in little cysts imbedded in the substance of the anther, opening irregularly.

WILLIAM WILSON.

Orford Mount, Warrington, July 1, 1845.

P. S.—If it be not a misemployment of the pages of the ‘Phytologist’ to correct an inadvertance in one of my former communications (Phytol. i. 6), I beg to state that the leaves of the holly have the petiole articulated as in ordinary cases, but that the articulation in age is scarcely if at all perceptible. If the young leaves be examined there can be no mistake.

Agaricus cristatus raised from Seed. BY GEORGE SPARKES, Esq.

FOR some years past I have been industriously sowing in a Ward's case the sporules of different Agarics, and during the two last months have had the pleasure of obtaining a good crop of *Agaricus cristatus*. Perhaps this may interest some of your readers.

GEORGE SPARKES.

Bromley in Kent, 30th June, 1845.

Our Reply on the name Lastræa recurva.

THE discussion on the name *Lastræa recurva* appears to have originated in a review (Phytol. ii. 22), in which we endeavoured to defend the term *recurva* against Mr. Babington's strictures previously published in the 93rd number of the 'Annals and Magazine of Natural History.' Our contributors having expressed their opinions freely on the subject, and nothing now remaining in our hands for publication, it seems desirable that we close the discussion by availing ourselves of our undoubted right to reply. Our view of the case has been supported by the Rev. Mr. Bree (Phytol. ii. 75), Mr. Wilson (Id. 113), Mr. Newman (Id. 114), Mr. Watson (Id. 170), and Mr. Edmonston (Id. 183), and has been opposed by Mr. Babington (Id. 113) and Dr. Bell Salter (Id. 200). It may perhaps be said that the question under discussion is one of individual interest to three of these botanists, since Mr. Bree is its author, Mr. Newman its adopter, and Mr. Babington wishes to suppress it in favour of a name of his own. We therefore exclude the arguments of these gentlemen from the observations which follow. The other disputants are perfectly unprejudiced, and can only have in view the adoption of the best name. We believe that almost all British botanists will regard the brief but pithy contribution of Mr. Wilson as overwhelming evidence in our favour, and not a few have regarded Mr. Watson's remarks as equally decisive, but we must not shelter ourselves under these high authorities, and thus endeavour to escape from the clever and pointed remarks of Dr. Bell Salter, the only disinterested opponent of the name.

Dr. Bell Salter seems to place the matter before our readers somewhat syllogistically, thus:—

1.—There exists a uniformity of practice among botanists in the use of the prefixes *in* and *re*.

2.—The structure of *Lastræa recurva* is that expressed by the prefix *in*.

Ergo, the name of *recurva* as applied to the *Lastrea* in question is in every way isolated and exceptional.

The *first* of these positions we hold to be totally unsupported by evidence: hence the *second* becomes scarcely more than a matter of opinion, and the *conclusion*, if based upon false premises, falls to the ground. Let us examine the first position:—

Dr. Bell Salter asserts that “common acceptation has universally applied the term *dorsum* or back to that surface of any part which is situated outwardly before its having expanded, and in accordance with this we have *in* applied to every curvature, which, supposing the part in question to be unexpanded, would be towards the axis of the plant, as *involutus*; and *re*, with the solitary exception of the controverted *Lastrea*, to a curvature, which, on a similar supposition, would be in the opposite direction, as *reflexus*,” (Phytol. ii. 200). Now it appears to us, that our correspondent assumes this position without taking the trouble to examine a single page of his Smith, his Hooker or his Babington to see how far his statement is in accordance with their usage. Let him turn to the genus *Pteris* as characterised by either of these authors. Smith says “Cover from the *inflexed* margin of the frond.” Hooker says “Involucres formed of the *inflexed* margin of the frond.” Babington says “Covered by a continuous indusium formed of the *inflexed* margin.” Now every botanist knows the direction in which the margin of *Pteris* is curved, and every botanist will at once see that it is precisely the curvature which Dr. Salter asserts is described by *re*, for he goes on to inform our readers that “according to the universal application of the particles *in* and *re*, a fern would be *incurved* or *inflexed*, which is concave on the polished or smooth surface, and *recurved* or *reflexed* if concave towards that which bears the sori, and that alike whether the bending happen to be upwards or downwards,” (Id. 201). In the familiar instance of *Pteris*, the usage of Smith and Babington is diametrically at variance with this passage, and supposing Smith accidentally in error, supposing Hooker accidentally adopting Smith’s phraseology, still Babington’s is a new, we might say, an original description, and the word *inflexed* is used, not because Smith used it or because Hooker used it, but because the author thought it the right word. Whether in strict justice we may or may not suppose that all these authors use the *in* advisedly, in courtesy we are surely bound to believe that they duly investigated the curvature in the pinnules of *Pteris*, and considered that such a curvature was properly described by the prefix in question.

Our next aim would have been to show that the prefixes *in* and *re*

should, in order to give them an intelligible meaning, be opposed to each other, that they should express curvatures in opposite directions; but Dr. Salter admits this, and therefore there is no necessity for our urging it on his attention. Well then, Smith, Hooker and Babington having carefully and advisedly declared a pinnule *inflexed* which is convex on the polished or smooth surface, these authors, supposing they assigned the opposite prefix *re* to the opposite curvature, would describe as *reflexed* or *recurved* the pinnules of *Lastræa recurva*, which are *concave* on the polished or smooth surface.

But here we must pause, for we are scarcely inclined to allow our great authorities the benefit of the implied compliment that they use these prefixes in accordance with any plan: were we to do this, we should convey a very erroneous idea to our readers. Those in advance of ourselves would exclaim "Does the 'Phytologist' imagine these authors adopt any uniform plan in their orismology?" Those who have not studied the English Flora, the British Flora and the Manual as we have done, may exclaim, "The point must be settled now that the 'Phytologist' adduces such united and overwhelming evidence!" The first conclusion, dear readers! would be unjust to us, the second unjust to yourselves. These great authors follow no uniform plan of orismology. A facetious writer, judging from the strangeness of certain Old-Bailey verdicts given after dinner, has suggested that the juries, in order to save themselves the labour of thinking, pronounced the prisoners *alternately* guilty or not guilty. Our botanists have done much the same. It is well known that the fertile pinnules of *Thelypteris*, *aquilina* and *crispus* possess a curvature in the same direction. Smith describes them as *revolute* in *Thelypteris*, *inflexed* in the genus *Pteris*, *revolute* in the species *aquilina*, and *reflexed* in the species *crispus*; Hooker omits this important character in *Thelypteris*, calls it *inflexed* in *aquilina*, and *revolute* in *crispus*; and Babington calls it *revolute* in *Thelypteris*, *inflexed* in *aquilina*, *reflexed* in *crispus*. So much for uniformity of practice in attaching the prefixes: we are really astonished that any botanist should allude to "universal" practice in this respect: we fancy our correspondent must have written the passage ironically. Be that as it may, Dr. Bell Salter will see that *he* has provoked this analysis: *he* has brought to light this discrepancy in practice, this unutterable confusion in terms, by not confining the question within its proper limits, by allowing himself to lose sight of the word *recurvus* and limiting his attention almost exclusively to terms which formed no part of the original inquiry. We therefore are compelled to fall back on the views of Mr. Watson (*Phytol.* ii. 170),

who explains the meaning of recurvus as curved contrary to the usual direction, whether upwards, downwards, outwards or backwards; and this is most undoubtedly a distinguishing character of *Lastræa recurva*: no other British Fern has a similar curvature, while several, as we have already seen, possess an opposite (the usual) curvature. But before the term received the powerful advocacy of Mr. Watson, Mr. Wilson's opinion (*Phytol.* ii. 113) that the name "was apt and expressive, and in perfect harmony with the use of the term in other cases," appeared to us so sound, so satisfactory and so incontrovertible, that we have regretted any attempt should be made to renew the discussion. We venture to express a hope that no further idea of changing the name will be entertained: but that our botanists will rather endeavour by diligent search to find this fern in other localities, since its great beauty and peculiarity is rapidly causing its extermination in the vicinity of London.

A Day's Botanizing on the Lizard. BY THE REV. W. S. HORE,
M.A., F.L.S.

A SHORT account of a day's botanizing on the Lizard, a district most interesting not only on account of its geological features, but also from the many rare and beautiful plants which grow on its rocky and steep cliffs, may not prove unacceptable to the readers of the '*Phytologist*.' Should any of them undertake an investigation of the Botany of this mass of serpentine, micaceous and hornblende rocks, the present sketch will enable them with little difficulty to obtain, in a single day, the species referred to below, and thus afford time for inspecting more carefully the whole line of coast from Porthalla to Mullion, the limits of the serpentine formation. I believe that a close examination of this district would amply reward the exertions of any active botanist, who might feel inclined to dedicate a fortnight to its accomplishment, and that he would find himself at the expiration of that time in possession of a richer stock of plants than he could have collected during a similar period in any other part of England.

The season that I would recommend is the beginning of July, when the Lizard plants are in finest condition, and when the whole of those enumerated in the present paper, with the exception of *Scilla verna*, may be obtained. To prevent disappointment I would however state that *Erica vagans*, the Cornish or Goonhilly heath, does not flower till August, and that any one whose principal object was to witness this

lovely plant, covering, with its snowy and pink blossoms, acres upon acres of barren moor, would do well to postpone his visit till the first week in September. The summer species, it is true, will then have passed away; but still a rich harvest of *Corrigiola littoralis*, *Elatine hexandra*, *Chenopodium botryoides* &c. may be culled on the banks of Loo Pool, a wide expanse of water near Helston, about six miles from the Lizard, and also *Illecebrum verticillatum*, *Exacum filiforme*, and *Lotus hispidus*, from the adjoining country: so that even at that advanced period of the year a visit would not prove altogether fruitless.

I have deviated somewhat from my intentions when I commenced this paper, having entered upon what may be called a general summary of Lizard vegetation, and an invitation to botanists to come, inspect and gather for themselves. I shall therefore proceed at once without further interruption to furnish an account of a day's wanderings on the Lizard in June.

I started with my friend, the Rev. C. A. Johns, in a gig from Helston on the morning of the 11th for Landewednack, the village adjacent to the Lizard lighthouses. Our immediate object was to search for the *Trifolium* discovered near Cadgewith by Babington, in July, 1839, and which he identified as *Trifolium Bocconi*, *Savi*. I had been kindly furnished by this indefatigable botanist, both with the exact locality and a specimen of the plant; but the latter was in such a scorched and mutilated condition, that I really feared some mistake had been made, and that the plant was nothing more than a stunted example of *Trifolium striatum*. Though well aware of my friend Babington's botanical accuracy, I could not consent to receive even his *dictum* pronounced over such imperfect plants as those collected by him, and therefore determined to use no ordinary exertions in my attempts to rediscover the habitat. I knew well that the plant must be in good condition, and that its identity with or distinctness from *striatum* would be at once manifest. Having traversed the Goonhilly downs, on which we found *Genista anglica* and *Chara gracilis*, and succeeded in capturing a beautiful specimen of *Zootoca vivipara*, of a splendid green colour, we reached the road leading to Ruan minor. Here I quitted the gig for the Bocconi station, which is situated about two miles from the turning. At Ruan minor I commenced work, and shortly met with a luxuriant specimen of *Trifolium striatum* near the spot marked out by Babington: my doubts were now much increased; but I continued, almost microscopically, to examine, step by step, the stony walls which bound the road to Cadgewith. At length a lighter hue on the western wall some yards a-head, announced the presence of a new

plant ; this, on approaching it nearer, I found to be *Trifolium Bocconi*, occupying a space of about twenty yards in extent. It was in good condition, and at once all doubts vanished as to its being a species perfectly distinct from both *T. striatum* and *scabrum*. It is a much smaller plant, of erect growth, with smooth leaves and of palish foliage. The corolla is light straw-coloured, but in one patch which I gathered it was tinged with red: the fruit in no single instance had been perfected. Johns, who had now rejoined me, and myself hunted for it in the adjoining fields, but without success, possibly on account of the short time we could afford to dedicate to the search. Whether the plant be indigenous or introduced would be difficult to say: had we discovered it in an additional spot we should both have firmly asserted the former. Having obtained a fair supply for ourselves and correspondents of this interesting trefoil, we proceeded with the Rev. P. V. Robinson, rector of Landewednack, through Cadgewith to one of the stations of *Asparagus officinalis*, which is situated about a quarter of a mile to the eastward of that place. Before reaching it I found *Herniaria glabra* in a luxuriant state, and Johns about the same spot met with the *Trifolium* which I discovered in 1838 near the Lizard Lights, and which is given in Babington's Manual as *Trifolium incarnatum*, var. β . *Molinieri*. Whether the plant is a mere variety of *T. incarnatum* I much doubt, and therefore avail myself of the present opportunity to point out the differences between its characters and those found in the diagnoses of the typical form, as given by Koch, Babington and others. *Trifolium incarnatum* is said to be *erect* by Babington, Koch and De Candolle, and *ascending* by Reichenbach; to have its *stipules obtuse* by Babington, *broad and obtuse* by Koch, and *obtuse and sphacelate* by De Candolle (the *Molinieri* variety wanting the latter character): to have the mouth of the calyx *hairy* by Babington, and the *throat obsoletely hairy* by Koch. The Lizard plant is in most cases *prostrate*, but sometimes with a tendency to ascend; the *stipules* are narrow, ovate and acute; the *throat* most decidedly *naked*; the hairs about the mouth of the calyx are such only as necessarily result from the villose character which this part presents. Whether these discrepancies are of sufficient importance to justify a separation of the two plants, I leave to more able botanists to determine. I should not omit to state, that not a single specimen with a red corolla was to be seen amongst the countless numbers which we observed on this and the former occasions.

As to this *Trifolium* being decidedly indigenous, the shadow of a doubt cannot be entertained by any one who has seen it growing in

another locality near Kynance Cove, which we subsequently detected. There, on the side of a ravine, quite out of sight of any land which has been cultivated, it grows in the greatest luxuriance, forming a large portion of the herbage. Years and years must have elapsed under the most favourable circumstances to have allowed it to have taken possession of such a residence, and to have ejected its previous possessors, supposing that it had been cultivated within a moderate distance of this locality. But the summit of the cliff appears never to have been broken by the plough, and the turf is as compact and solid as can be imagined, producing the ordinary plants of the district. I also made inquiries respecting the cultivation of the *Trifolium incarnatum*, and found that it was not known in the neighbourhood.

These incidental, though I trust not irrelevant remarks on the two *Trifolia*, have somewhat extended the original limits within which I purposed confining the account of my Lizard wanderings. I will therefore more briefly record our further proceedings.

We did not venture into the Asparagus station, partly I believe for want of time, and partly on account of the numerous vipers which domicile in the long grass where the plant grows. We consequently retraced our steps to Cadgewith, and proceeded along the coast to Landewednack, where we were engaged to dine with Mr. Robinson. On our road we met with *Vicia lutea*, which Johns had found during our excursion in 1838, and which was then not known to grow in the south-western counties, and *Herniaria glabra*, β . *subciliata*. The scenery along this part of the coast is most beautiful, withdrawing our attention most repeatedly from the legitimate duties of the day.

Having partaken of Mr. Robinson's hospitality, we again started forth, directing our steps coastwise to that richest of spots, Kynance Cove. Here the scenery was of a higher character than that which we had witnessed in the morning, and we lingered oftentimes in our course to gaze on the many beauties which presented themselves to our notice. Still we bore in mind that our vasculums were to be filled, and we accordingly proceeded to store away such rarities as *Alsine verna*, *Anthyllis Vulneraria*, β . *Dillenii*, *Allium Schoenoprasum*, *Genista pilosa*, *Scilla verna*, &c. It was between the Lizard Lights and Kynance Cove that we came on the locality of *Trifolium incarnatum*, var. *Molinieri*? alluded to above, a distance of five miles along the coast, and upwards of two in a straight line from the Cadgewith habitat.

When we arrived at Kynance Cove, the shades of evening were beginning to close around us, and we had yet to obtain other botanical

rarities. We accordingly gave up all idea of passing over to Asparagus Island, and calling at the post-office and other departments belonging to his satanic majesty at that spot. *Geranium sylvaticum*, *Cladium mariscus*, &c. we allowed to remain unmolested; and having found ourselves too early for *Orobanche rubra* and *Achyrophorus maculatus*? which we had gathered on a former occasion, and of each of which we now only met with a single plant in bud, we proceeded on to another locality for *Asparagus officinalis* and *Allium Schoenoprasum*. Night, however, overtook us and we were compelled to forego our intentions and return to Landewednack, which we left about 10 o'clock for Helston, where we found ourselves at 12, after a pleasant drive on one of the most delightful nights of the present season. I need not say that we were highly satisfied with the result of the day's excursion.

W. S. HORE.

Trafalgar Place, Stoke, Devonport,
June 27, 1845.

Description of a species of Orobanche new to Great Britain, probably Orobanche amethystea, Thuillier. BY THE REV. W. S. HORE, M.A., F.L.S.

THE plants from which the following description was taken were collected by the Rev. C. A. Johns, Mr. Thomas Edmondston, Jun. and myself, in a farewell botanical excursion to Whitsand Bay, a few days before Edmondston's departure on the Californian expedition. His friends will be glad to learn that he quitted England in excellent health and spirits, anticipating with delight an investigation into the botanical and zoological riches of an almost unknown country.

Orobanche amethystea, Th.

Bracts rather shorter than the corolla; *sepals* bifid, with two strong nerves and several rather indistinct ones, ovate at the base, with the laciniae subulate and shorter than the tube of the corolla. *Corolla* tubular, curved immediately from the base and subsequently straight; lips unequally toothed, undulate, with branched veins; upper lip hooded, emarginate, the border recurved; lower lip three-lobed, the lateral ones smaller than the intermediate one; between the lobes on each side is a convex process, caused by the sudden expansion of the substance of the corolla on leaving the tube. *Stamens* inserted near the base of the corolla, glabrous externally, but furnished with numerous hairs internally at the base, which gradually disappear about the

middle of the filaments. *Stigma* two-lobed, with the lobes divaricate. *Style* nearly glabrous, furnished with only a few glandular hairs. *Capsules* oblong, cylindrical.

The stem is originally whitish, assuming a purple hue as the flower expands and finally becoming reddish brown. The tube of the corolla is whitish, with the lips straw-coloured, marked with purple veins; the purple markings extend in some cases for a short distance down the tube. The bracts and sepals of a light purple. The stigma purple and the stamens in unopened flowers the same, becoming brownish-black on attaining maturity. The spike is lax, and the bracts at the base of the stem not numerous. Parasitical on *Daucus maritimus*.

This plant is very distinct in the form of its corolla and general characters from *Orobanche barbata*, the only species growing in the western counties with which it may be confounded. I have carefully examined the two plants in a living state at the same time, having received through the kindness of Miss A. E. Griffiths beautiful specimens of the latter from Torquay, where it grows in abundance on ivy. *Orobanche minor* is a very different plant.

The description given above agrees very nearly with those by Koch and Reichenbach of *Orobanche amethystea*, *Thuillier*. The chief difference is in the length of the sepals, which certainly do not exceed or even equal the corolla. But Reichenbach and Koch are themselves at issue on this point, and therefore much importance is not to be attached to such a varying and indefinite character. A slight discrepancy also apparently exists in my description of the under lip of the corolla and that given by Koch: he describes the intermediate lobe as trifid, apparently assigning an equality of value to the three divisions of which it is composed, whilst I look upon it as simple, furnished with two convex processes: my reasons for so doing are that no nerves enter into these processes, whilst they are very apparent in the true lobes. One other difference remains to be pointed out: it is that whilst *Orobanche amethystea* is parasitical, according to the above authorities, on *Eryngium campestre*, the Whitsand Bay plant grows on *Daucus maritimus*. Whether our *very* critical botanists will deem this latter point sufficient to keep the two plants distinct, I cannot say; but for my part I have no hesitation in considering them identical, agreeing as they so thoroughly do in the curvature of the tube of the corolla and the characters of the pistil and stamens.

W. S. HORE.

Stoke, Devonport, June 27, 1845.

On a Monstrosity of Cardamine pratensis. BY W. A. BROMFIELD,
M.D., F.L.S.

I FOUND on the 28th of May last, in a moory meadow by the Medina, below Rookley, a solitary specimen of *Cardamine pratensis*, affording a singular instance of abnormal development, and which, though possibly not very uncommon, it may yet be interesting to vegetable morphologists to record. On the lower part of the corymb were several seed-vessels elevated on very distinct pedicels, and changed from their usual linear form to an ovate elliptical figure, so as to resemble the short pod or siliqua of genera belonging to the first section of the natural order Cruciferae. These, on being opened, were found to contain petals of the usual pale pink or purple colour, which in the pods above had burst from their confinement at the commissures and appeared as semi-double flowers, the valves of the pods answering exactly by their position to the true calyx. At the summit of the stem the flowers had the ordinary appearance, except that the stamens were changed into petals; and on opening the ovary of the highest blossom, no ovules were discoverable amongst the mass of petaloid laminae with which the cavity was filled. From their verticillate arrangement it is evident that these petaloid expansions were not transformed seeds, as I hoped to have found them, but simply a development of the common axis within the ovary into an abortive whorl of floral organs, which structure was clearly manifested by the evident rudiments both of stamens and pistil in the centre of the verticil. The lowermost pedicellate pods had doubtless been at first surrounded by the regular floral envelopes; from some cause they had not emitted these last at the sutures like the rest, but assumed the puzzling appearance of well-formed seed-vessels, belonging to species of a different section of the order.

WILLIAM ARNOLD BROMFIELD, M.D.

Ryde, Isle of Wight, June 24, 1845.

Periodical disappearance of Cœnanthe pimpinelloides. BY W. A.
BROMFIELD, M.D., F.L.S.

MR. E. LEES (*Phytol.* i. 1020), has noticed the "uncertain occurrence" of this plant in Gloucestershire; I can add my testimony to the inconstancy of what I assume for the present to be the same species in this island, where either the true *Cœ. pimpinelloides*, or one or more

of the allied species said to be confounded with it, usually abound through its entire length and breadth. Last season I much wished to have examined what I have hitherto regarded as *Œ. pimpinelloides* and *Œ. peucedanifolia* of British botanists, with a view of ascertaining whether one or both might not rather be referred to *Œ. Lachenalii* of Mr. Babington's excellent Manual, not having as yet devoted much attention to the subject. Whether from something unfavourable in the season, or from a consciousness of demerit in passing through life under false names, I know not, but certain it is, that when wanted particularly for examination, both species contrived to make themselves so exceedingly scarce, that I only fell in with a few specimens of what I have been in the habit of calling *Œ. peucedanifolia* at the close of the summer. I am greatly inclined to the opinion that we have but one genuine species (under the above-names) in the I. of Wight, and perhaps, may I not add, in the whole of Britain? Our common plant here (*pimpinelloides*?), assuredly a most variable species, and accommodating itself to every kind of situation, from dry pasture and mowing lands to the wettest salt marsh, it is not to be wondered at if its external characters should be as multifarious as its localities are different. I shall not enter at present upon any discussion of a question so difficult as the determination of the British species of *Œnanthe*, but as the plant which currently passes for *Œ. pimpinelloides* has vouchsafed to present itself again this year in its usual abundance, I trust to be enabled to lay before the readers of the 'Phytologist' the result of my observations made on an extensive series of fresh specimens, in every stage of advancement towards perfect maturity.

W. A. BROMFIELD, M.D.

Ryde, Isle of Wight, June 27, 1845.

Account of a Botanical Excursion to the Bass Rock, in July, 1844.

BY WILLIAM KEDDIE, Secretary of the Botanical Society of Glasgow.*

PROFESSOR BALFOUR's class excursions, which have contributed so much during the last three summers to extend our knowledge of the flora of the west of Scotland, were this season diversified by a visit to the east coast, including the Bass Rock. The pleasure of exploring a field of botanical research which was new to all the party except

* Read before the Botanical Society of Glasgow, and communicated by Professor Balfour.

the Professor himself, was greatly enhanced by the historical interest of the district which they traversed. It is hoped that a cursory notice of the plants which they collected and of the places which they visited may not be unacceptable to the Society.

On Friday, the 12th of July, 1844, the party went by the 11 o'clock train to Edinburgh, where they arrived at 1, P. M.; and having been joined by three gentlemen belonging to that city, making the number sixteen in all,* they immediately drove off in a stage coach which had been engaged to convey them to their destination. The route lay along the coast of the Firth of Forth for about 25 miles in a south-east direction. There is little to interest the stranger in the general aspect of the coast, which consists chiefly of long flat reaches of sand, and possesses few of the features which lend beauty and variety to the shores of the Firth of Clyde. The inland district, however, is highly cultivated, and fertile to a degree scarcely exceeded in any other part of Scotland; and it was curious to observe, that this luxuriant vegetation often owed its protection from the sea breeze solely to a stripe of blighted shrubbery, separating the fields and gardens from the bleak and exposed shore. This is particularly the case at Gosford, the seat of the Earl of Wemyss, where the plantation behind the walls is cut down by the blast in such a way as to exhibit the appearance of an inclined plane rising from the top of the wall. But the absence of interest in the monotonous appearance of the coast was amply compensated for by the charms of historical association with which it abounds; and neither the peculiar aim nor the rapidity of the journey could altogether exclude objects of this kind from our curiosity and regard. The ancient town of Musselburgh and its immediate neighbourhood is singularly rich in antiquities, having, from its proximity to the capital, been the scene of some of the most striking events of our history. While crossing the Esk, which divides the burgh from the suburban village of Fisherrow, we had a view of an old bridge, which is worth travelling as far to see on its own account,—“a structure” Mr. R. Chambers mentions, “supposed to be of Roman origin, and over which the Highland army of Prince Charles Stuart passed on their way to the field of Prestonpans in 1745, and which had been crossed in like manner, two centuries before, in 1547, by the Scottish army on their march to the field of Pinkie; a structure,” he adds, “over which all of

* The party consisted of Dr. Balfour, Messrs. Miller, Craig, Murray, MacLellan, Thomson, Risk, Sharp, Crawford, Ramsay, Stevenson, Keddie, Connal, Holden, Ashby and Douglas.

noble or kingly birth, that had approached Edinburgh for at least a thousand years, must certainly have passed ; which has borne processions of monks, and marches of armies, and trains of kings ; which has rattled under the feet of Mary's frolic steed, and thundered beneath the war-horse of Cromwell." Near the bridge are found *Mentha sativa*, *β. rubra*, and *Chenopodium olidum*. At the eastern extremity of Musselburgh the road skirts the links or sand downs where the Marquis of Hamilton, as the commissioner of Charles I. was met in 1638 by assembled thousands of the Covenanters, who lined the road to Edinburgh during his progress ; and here also Cromwell encamped his infantry while his cavalry were quartered in the burgh in 1650. The Links are famous in a botanical point of view as being a station for *Trifolium ornithopodioides*. Pinkie House, which has been celebrated both in song and story, is beautifully situated in the same neighbourhood, within sight of the road ; and as we passed along we caught glimpses of the battle-field of Prestonpans, and of the house inhabited in 1745, by the gallant and pious Colonel Gardiner, who fell in that engagement. Prestonpans, which has become celebrated in modern times for the ale it brews, still carries on its ancient manufacture of salt. The monks of Holyrood and Newbattle, the early superiors of this and the adjoining parish of Tranent, were the first to establish salt-pans on the shore of Preston (Priestistown) village, which therefore received the name it bears in ancient ecclesiastical records of 'Salt Preston.' The manufacture, however, is now carried on, not by the evaporation of sea-water, but by the purifying and recrystallising of rock-salt imported from the neighbourhood of Liverpool. We made a brief stay at the village of Aberlady, which is remarkable only for its spacious bay, affording sea-room for a whole fleet. Our countrymen in these parts, at the period of the threatened invasion by France, considered this to be the spot which Napoleon would in all probability select for disembarking his troops. Had he done so, the probability is equally strong that he would not have tarried longer than we did in a region offering but indifferent temptations to the cupidity of an invader, whether he comes armed with the munitions of war, or bearing the peaceful implements of the spadix and vasculum.

About 5 o'clock we reached North Berwick, and having made the necessary arrangements for our accommodation for the night, set off by our stage coach for the Bass. The shore here becomes rocky and precipitous, presenting a succession of bold cliffs, contrasting agreeably with the quiet sandy bays by which they are intersected. This is the trappean district of the coal-measures, and the junctions of the

trap and sandstone exhibit many curious alterations in the texture of both rocks. The conical hill named North Berwick Law, which springs sheer from the surrounding plain to a height of about 900 feet above the sea-level, and is seen for many miles on both sides of the Firth, together with several scattered islets of the shore, appear to belong to the same geological period, and consist of felspathic trap of a reddish hue. One of these islets, standing about a mile and a half from the shore, and to which access is obtained by a boat from Canty Bay, is the Bass, which is celebrated as having been the bastille of Scotland in the time of the Covenanters. It presented some rare botanical as well as historical attractions to our party, and after a long day's expectation of the reward that awaited them, it was perhaps excusable to gratify their botanical ardour first, and then to indulge in the recollections which the place was so well fitted to awaken. Accordingly, no sooner had they achieved a footing in a somewhat difficult landing-place, and scrambled up the rocks on the only side of the islet where it is accessible, than they were gratified to find abundance of *Beta maritima* growing under the shade of the dismantled fort. The crowning attraction, however, was within the walls, where the Professor introduced them to a sight which was indeed a novel one to all present except himself. This was a perfect forest of *Lavatera arborea*, the tree mallow of the Bass, a plant indigenous in a very few localities in Scotland. The rarity and profusion of this beautiful plant in a station so unpromising and inhospitable, afforded the party unmingled delight—that kind of delight which only botanists feel in discovering a new or rare plant in a new station. The rock is productive of no other plants of note, and the catalogue of its entire flora is very soon exhausted. In addition to the above we observed *Silene maritima*, *Cochlearia officinalis*, *Lychnis diurna*, *Hieracium pilosella*, *Geranium molle*, *Urtica dioica*, *Holcus lanatus*, a glaucous var. of *Festuca ovina*, *Cerastium semidecandrum*, *Dactylis glomerata* and *Carduus lanceolatus*. The rock is about a mile in circumference, and rises 420 feet above the level of the sea. Its northern face rises perpendicularly nearly to the full height of the rock. On the south it slopes down gradually till near the base, presenting an outline which has been compared to that of the old-fashioned box which used to grace the side-board as a receptacle for knives and forks. A cavern penetrates the rock from east to west, and may be explored at ebb-tide. The islet offers but one landing-place, which is on the south-east. We were fortunate enough to have visited the Bass during the period of incubation of the solan geese, which

frequent the rock in incredible numbers. The discharge of a fowling piece as we sailed round the rock before landing, startled myriads of these and other sea-birds, which literally darkened the air as they took flight; although successive repetitions of the experiment were less and less successful in alarming them. The bare shelves and ledges of the rock were whitened on all sides, except at the landing-place, with birds watching their callow young or hatching their eggs; and in these circumstances they allowed themselves to be approached without evincing any symptoms of uneasiness, unless when certain of the more adventurous of the party poked their fingers into their open bills. The solan goose, the black and white gull, the kittiwake, the puffin or Tammy-norrie, the falcon, the eider-duck and the cormorant, with a few other birds, divide the tenantry of the rock with about two dozen sheep, which yield to gourmands the celebrated Bass mutton.

The Bass was for many generations the property of an ancient family named Lauder of the Bass, but was purchased by government in 1671, and converted into a state prison for the Covenanters under the reign of Charles II.; which purpose it continued to serve till the revolution. It held out against the new dynasty at that period, and was signalised as being the last place in Great Britain which yielded to William III. In 1701 the fortifications were demolished, and in 1706 the Bass was granted by the Crown to Sir Hew Dalrymple, then President of the Court of Session, in the possession of whose descendants it has hitherto continued. The fort and the prison-house are now unroofed. An old chapel is alone distinguishable by the niches for the fonts, which would appear to assign it an origin prior to the reformation. The early history of the place is buried in obscurity, but it has acquired an interest from its associations with the martyr-memories of the Covenanters, which none who revere their characters and principles "would willingly let die." It is surely no unfit application of Dr. Johnson's well-known sentiment on visiting Iona, to say, that the man is little to be envied whose piety, and whose patriotism too, would not grow warmer amidst the ruins of the Bass.

On regaining the shore, we directed our steps during a beautiful sunset towards Tantallan Castle, gathering on the way specimens of *Scabiosa Columbaria*. This magnificent and venerable ruin covers a bluff headland about three miles from North Berwick, and overlooks the German Ocean, by which it is surrounded on three sides, the fourth having been protected by a double ditch and powerful out-works. The external structure is nearly entire, the walls being of prodigious

thickness. Tantallan was a stronghold of the Douglas family. Over the entrance there still remains, though nearly obliterated, the sculptured blazon of the bloody heart, the well-known emblem of that powerful and haughty family. The situation and strength of this fortalice long set at defiance every attempt at its reduction, and gave rise to the popular belief that it was impregnable and indestructible. "Ding down Tantallan!—mak a brig to the Bass!" became a proverb expressive of the belief that the one project was as impracticable as the other. The barony of North Berwick and the castle of Tantallan were forfeited by the earl of Douglas in 1455, and were given by James III. to the fifth earl of Angus, known in history as "Archibald Bell-the-cat;" and whose earnest but ill-requited remonstrance with James IV. on the eve of the battle of Flodden, against the war with England, and his consequent retirement to Tantallan, have been celebrated by Sir Walter Scott in *Marmion*. When the succeeding earl of Angus had incurred the displeasure of James V., he shut himself up in this castle, which held out against a siege conducted by the monarch in person. The king "borrowed" says Sir Walter "from the castle of Dunbar, then belonging to the Duke of Albany, two great cannons, whose names, as Pitscottie informs us with laudable minuteness, were 'Thrawn-mouth'd Meg and her Marrow;' also 'two great botcards, and two moyan, two double falcons, and four quarter falcons,' for the safe guiding and redelivery of which, three lords were laid in pawn at Dunbar!" King James, notwithstanding these means and appliances, was obliged to raise the siege, and only got possession of the place afterwards by treaty with the governor. It is foreign to the present purpose to trace the history of this remarkable seat of feudal power. Amidst its varying fortunes it continued to maintain its reputation as a place of strength, and set at defiance the military art of the times, till it was "dung down" by the Covenanters in the reign of Charles I., its lord at that time, the Marquis of Douglas, having identified himself with the royal cause. Sir Walter Scott describes the castle with characteristic minuteness and vivacity:—

" But scant three miles the band had rode,
 When o'er a height they passed,
 And sudden, close before them show'd
 His towers, Tantallan vast,
 Broad, massive, high and stretching far,
 And held impregnable in war,
 On a projecting rock they rose
 And round three sides the ocean flows,

The fourth did battled walls inclose,
 And double mound and fosse.
 By narrow draw-bridge, out-works strong.
 Through studded gates an entrance long,
 To the main court they cross.
 It was a wide and stately square ;—
 Around were lodgings, fit and fair,
 And towers of various form,
 Which in the court projected far,
 And broke its lines quadrangular.
 Here was square keep, there turret high,
 Or pinnacle that sought the sky,
 Whence oft the warder could descry
 The gathering ocean storm."

In the spacious court of the castle *Conium maculatum* grows rank amongst the ruins. We gathered also *Lepidium latifolium* on the edge of the cliff, and were fortunate in discovering a quantity of *Hyoscyamus niger* in fine condition, occupying, with its drooping lurid flowers and fetid odour, an appropriate place in an obscure corner of the castle. *Sambucus nigra* grows here in wild profusion, as indeed it does along the whole coast. *Carduus acanthoides* and *marianus* were also found. We left Tantallan with reluctance, while the evening sun was pouring a stream of golden light into its silent court and deserted halls, and had instinctively turned, ere we leaped across the moat, to take a lingering look at the venerable pile, when our reveries were broken by the last of the party rushing from the entrance in a fine fit of poetical frenzy, and shouting after us the parting words of Angus to Marmion :

"And hop'st thou hence unscathed to go?
 No, by Saint Bryde of Bothwell, no!
 Up draw-bridge, grooms!—what, warder, ho!
 Let the portcullis fall!"

By this time the Professor, with a considerate regard for the condition of his "followers," who had been fasting all day, was in full cry upon a bank of mushrooms (*Agaricus campestris* and *Georgii*) in an adjoining meadow, which were carefully deposited in his vasculum to give an additional relish to a repast intended to do for the threefold duty of dinner, tea and supper. As we retraced our steps to North Berwick, we picked *Triticum junceum* and *Briza media* near the shore; and in the fields and by the way-side *Lithospermum arvense*, *Scandix pecten*, *Anthriscus vulgaris*, *Lychnis vespertina* shedding its richest odors to a beautiful Scottish 'gloamin,' *Lychnis Githago*, and

Serrafalcus commutatus ; and thus occupied we proceeded on our way till we reached the inn in the twilight.

At an early hour next morning we left North Berwick on foot, to botanize along the coast on our return, and were successful in meeting with a number of plants which were new to most of the party, and several of them peculiar to that part of the county. On the sandy shore near North Berwick, and as we proceeded along the extensive sand-downs stretching to a considerable distance inward from the shore, we gathered *Astragalus hypoglottis*, *Thalictrum minus*, *Equisetum variegatum*, *Habenaria viridis*, and *Eryngium maritimum*. Amongst the numerous sandy knolls which have been thrown up in the interior, we found abundance of *Ammophila arenaria* and *Carex arenaria*, the long creeping stems and roots of both of which plants serve the useful purpose of preventing the sand from drifting further inland upon the cultivated fields. *Cynoglossum officinale* was also found growing profusely on these knolls, and occurred in other parts of our morning walk. In the same neighbourhood we picked *Tragopogon minor* ; and in marshy spots on the common, *Veronica Anagallis* and *Helosciadium repens*. On Dirleton Common, after a good deal of searching, we found *Acinos vulgaris* and *Silene conica* in small quantities, the station having evidently suffered from the depredations of previous botanical visitors, equally entitled with ourselves, there is reason to believe, to the designation of Radicals. From the common we rambled into the adjoining fields, which presented us with a favourable example of the cultivation and fertility for which the county of Haddington is celebrated. Here we gathered *Reseda lutea*, *Papaver Argemone*, *dubium* and *Rhœas*, the two latter growing in great abundance,—a characteristic of the eastern district of the county. When these species occur near Glasgow, they appear to be chiefly in fields, sown perhaps with grain brought from the east. We picked also *Silene inflata* and *noctiflora*, *Galium Mollugo*, *Trifolium arvense*, *Anagallis arvensis*, *Fumaria capreolata*, *officinalis* and *micrantha*. *Alyssum calycinum* also grows in small quantities on the common. The ramble from North Berwick to Dirleton by this circuitous route, occupied about four hours, and as the weather was most agreeable, and our success had fully equalled our expectation, we arrived at Dirleton in high spirits, with full vasculums and empty stomachs, and a keen relish for breakfast, which we afterwards flattered ourselves must have made the statistics of that repast somewhat memorable to the hostess of Dirleton Inn. And Dirleton, we all confessed, when we had time to draw breath, to be the most perfectly beautiful village we had ever

seen, perhaps all the more beautiful from the English rather than the Scottish taste displayed in its arrangement. In laying it out, every advantage has been taken of a choice situation. The cottages, which are screened by trees, and wreathed with climbing plants, are ranged along two sides of a green, representing the English common on a small scale, with its appropriate flock of geese. Even the sign-board of the village shoe-maker peeped out upon the green through the branches of a Fuchsia radiant with a blaze of drooping blossoms. Everywhere there is an air of tidiness and taste, of comfort and quietness about the place, alike novel and refreshing, and which justly entitles Dirleton, to be regarded, like Goldsmith's Auburn, as the "loveliest village of the plain." Mr. Chambers remarks that "altogether Dirleton may be termed one of the prettiest,—if not actually *the prettiest*,—village in Scotland." On the south side of the green, stands the ancient ruin of Dirleton Castle covered with ivy and embosomed among trees, and commanding a magnificent view of the sea coast on one side, and the luxuriant plains of the interior on the other. The garden in which it is situated is surrounded by a modern wall, "built" the above-mentioned writer says, "in the style of a barbican with turrets;" and nearly the whole of the improvements in its vicinity have been effected in the very best taste. The general style of the cottages in the neighbourhood preserves a corresponding antique character. The proprietors of the estate are Mr. and Mrs. Ferguson, of Raith, the latter possessing the right by descent; and they generously afford free access to the garden and castle. We availed ourselves of this privilege, and found the garden under excellent management. The arrangement of the grounds has been conducted with the exquisite discrimination and skill displayed in all the improvements effected by the proprietors. The mildness of the climate is favourable to the growth of many of the more delicate exotics, of which we saw a rich variety in the open air, including numerous fine annuals. Amongst the ruins of the castle we picked *Parietaria officinalis*, remarkable for the elasticity of its stamens, *Cheiranthus cheiri*, *Smyrnium Olusatrum* and *Vicia hirsuta*; also *Sedum reflexum* and *album*, *Corydalis lutea* and *Linaria Cymbalaria*, which were, however, evidently escapes from the garden. Dirleton Castle is of high antiquity, and has been associated with the fortunes of several families, occupying a prominent place in our early history. It was dismantled by the Parliamentary army in 1650. Possession of the castle in its better days was held out, and not unsuccessfully, to the Earl of Ruthven, as an inducement to join the Gowrie conspiracy. His written corre-

spondence with Logan of Restalrig on this subject, not only shows his desire to become the possessor of such an eligible property, but the terms in which he expresses himself imply that the district of country in which it is situated was even at that early period enriched by cultivation. "I cair noch" says he "for all the land I hae in this kingdome, in case I get a grip of Dirleton, for I esteme it the pleasantest dwelling in Scotland."

We now took our departure from 'pleasant' Dirleton, and made for the neighbouring woods of Archerfield. In the ditches on our way we observed *Veronica Anagallis* growing to the unusual height of four feet or more, and interspersed with *Nasturtium officinale*, also very large. In the wooded grounds we picked *Rumex sanguineus*, *Listera ovata*, *Epipactis latifolia*, *Epilobium hirsutum*, and observed *Nuphar lutea* growing in the pond and adjoining stream. Emerging upon the public road, we picked *Pyrethrum Parthenium* growing in a hedge. Along the road-sides between Archerfield and Gullan we found *Convolvulus arvensis*, *Knautia arvensis*, *Centaurea Scabiosa* and *Anthemis Cotula*. At Gullan, a village which has acquired some celebrity for the training of race-horses on its ample sand-downs, we continued to pursue our own pleasant and innocent sport;* and here again we met with *Hyoscyamus niger*, also *Geranium pusillum*, and rarer still, by the margin of a small pond near the village, we picked *Limosella aquatica*. It being now about mid-day, several of the party, who contemplated returning to Glasgow that evening, were under the necessity of reluctantly separating from the main body, who continued to explore the coast during a leisurely walk towards Edinburgh. Three of our number who had risen with the morning sun to ascend North Berwick Law, had been informed by the fishermen, that the peculiar ruddy light portended a rainy day. We had little apprehension of the fulfilment of this prediction as we scoured the links between North Berwick and Dirleton during the bright sunshine of a delightful morning; but as the day advanced it brought unpleasant symptoms of the soundness of the old fishermen's conclusions. Latterly it rained in torrents, but botanists wear a charmed life. A slight degree of discomfort was the only inconvenience the party sustained from their drenching, which could not damp the ardour of their pursuit, as the remainder of the list of plants collected will testify. On Gullan Links we gathered *Cerastium arvense*, *Erythræa linarifolia*, *Thrinicia hirta*, *Echium vulgare* and *Anagallis tenella*, a plant which abounds in the

* Wordsworth says of botanists, "there is no poison in their sport."

west but is by no means common on the east coast. In Gullan loch and its vicinity *Sium angustifolium*, *Helosciadium repens*, *Utricularia vulgaris*, *Poa aquatica*, *Hippuris vulgaris*, *Scirpus lacustris*, *Potamogeton densus*, *Carex intermedia*, *teretiuscula* and *fulva*. In the fields near Luffness, *Campanula hybrida*, *Silene noctiflora*. At Luffness Burn, *Carex paludosa*. On the neighbouring shore, *Salicornia herbacea*, *Schoberia maritima* and *Zostera marina*. Between Luffness and Aberlady, *Trifolium fragiferum*, *Blysmus rufus*, *Rottbollia incurvata*, *β. filiformis*, *Carex distans*, *Carduus tenuiflorus* and *Malva rotundifolia*. Near Aberlady, *Hippophaë rhamnoides*. At Gosford, *Gernium sanguineum*, *Gentiana campestris* and *Amarella*. Near Cockenzie, *Pulicaria dysenterica*, *Ononis arvensis*, *Carduus nutans*, *Rosa spinosissima*, *rubiginosa*, *canina* and *tomentosa*.

WILLIAM KEDDIE.

June 1845.

Memoir of the late Mr. Griffith (from the 'Transactions of the Royal Asiatic Society' for June, 1845).

MR. GRIFFITH was one of the most accomplished botanists of our day ; with the most accurate and extensive acquisition of learning in his department, he combined such a spirit of activity and enterprise as has been rarely equalled, great talents, and a very remarkable power of labour, arrangement, and application. He was born in the year 1810, and was educated at the London University. He went out to India, as an assistant-surgeon on the Madras Establishment, where he arrived on the 24th September 1832, and was shortly afterwards selected by the Bengal Government to examine the Botany of the Tenasserim Provinces. He was, in 1835, deputed to Assam, with Dr. M' Clelland, for the purpose of assisting Dr. Wallich in his inspection of the growth of the tea plant in Assam, and proceeded from thence, in company with Dr. Bayfield, to the then unexplored tracts which lie between Suddiya and Ava, upon the extreme frontier of our Eastern territory. In 1837 he accompanied Captain Pemberton on his mission to the wild countries of Boutan, and two years after was sent, with the army of Indus, to prosecute inquiries into the Botany of Affghanistan. In 1841 he was appointed to the medical duties of Malacca. Upon Dr. Wallich's absence, owing to illness, at the Cape, Mr. Griffith was intrusted with the superintendence of the Botanical Garden at Calcutta, and with the duties of Botanical Professor in the Medical

College ; but having, on the return of Dr. Wallich from the Cape, resumed his place at Malacca, he was there seized with disease of the liver, and died at the early age of thirty-four, having already acquired a distinguished reputation,—having, in every capacity wherein he served the government, received its approbation and its thanks ; and having given a promise of such further services to botanical science as few have had either the opportunity or the talent of affording. In all his varied and extensive journeys his courage and his energy never failed him ; whether in the jungles of Assam, or the hills of Affghanistan, he still pursued his researches, undeterred by danger, either of disease or of violence ; and if disabled, as he was more than once by fever and debility, his first convalescence found him ever ready for fresh exertions. He had thus, by the application of extraordinary powers of observation, and in researches extending through the vast regions which have been enumerated, formed large and valuable collections, and brought together materials for a great botanical work ; and he looked with impatience to a period of repose for compiling a scientific Flora of India, when he sunk under his last fatal illness. Perhaps no more impressive picture of the energy of this extraordinary man, and of his devotion to his favourite science, can be given than that which may be drawn from the following extracts from a letter dictated by him on his death-bed, and addressed to Dr. M'Clelland :—

“ I write this by deputy, being seriously ill of hepatitis ; the attack has been very severe, and the treatment necessarily active, so that I am reduced to an extreme state of weakness. Although my adviser does not despair, still the issue is doubtful, and under this impression I commence a few lines to you on business.

“ Mrs. Griffith (supposing the result of this illness to be fatal to me) will bring up with her all the collections at Malacca, and they being added to those at the export warehouse, and all having been previously cleaned and packed, I leave you to present to Government, for the Honourable Court of Directors, to be sent home without any delay. As you know the trouble I have taken with these collections, and the hopes I had entertained of making them subservient to a general scientific Flora of India, I need not impress on you how much I am interested in their proper disposal, and their being brought properly before the scientific public ; and I would say the same regarding my drawings and manuscripts, which will accompany my wife to Calcutta, should it so happen that I leave her.

“ In all the plans which I have consigned to your execution, both regarding my wife and collections, I am confident your own feelings

will prompt you to every exertion on my account. Asking God's blessing on you and your wife, I bid you good bye."

"Thus far," continues Dr. Moorhead, his medical attendant, "was written at Mr. Griffith's dictation; but I grieve to say the fatal result came to pass yesterday evening, Sunday, 9th February, at half-past seven o'clock."

Memoranda on the above by Dr. McClelland.—"To the above details, furnished by Dr. Moorhead, I may add that Mr. Griffith's constitution for the last two or three years seemed greatly shattered, his energies alone remaining unchanged. Exposure during his former journeys and travels laid the seeds of a fatal malady in his constitution, while his anxiety about his pursuits and his zeal increased; he became care-worn and haggard in his looks, often complaining of anomalous symptoms marked by an extreme rapidity of pulse, in consequence of which he had left off wine for some years, and was obliged to observe great care and attention in his diet. In Affghanistan he was very nearly carried off by fever, to which he had been subject on his former travels in Assam. No government ever had a more devoted or zealous servant, and I impute much of the evil consequences to his health, to his attempting more than the means at his disposal enabled him to accomplish with justice to himself."

Although Mr. Griffith's researches were directed primarily to Botany, he neglected no opportunity, during his visits to various parts of India, of attending also to other departments of Natural History. Of his zeal and success in Zoology, his collections afford abundant proof; they consist chiefly of Mammalia, birds, fishes, and insects. While attached to the army of the Indus, he made, on account of Government, large collections of Mammalia and birds, which have been transmitted to the Honourable Court of Directors, and constitute a valuable addition to the museum at the India House. In Mammology he collected a considerable number of the smaller animals of Affghanistan, among which are several new to science; but his ornithological collections are still more extensive, having brought together about six hundred specimens, not only from the route of the army, but from several separate excursions to the ranges of mountains north of Cabul. Besides the discovery of a considerable number of new species, the interest of these collections consists in their affording, perhaps, the most extensive and instructive illustration of the geographical distribution of the several species of birds found in India, which has as yet been attempted.

Mr. Griffith has also been zealous and successful as a collector of

the fresh-water fishes of India, during his various travels : the importance and extent of these is detailed in a paper on the subject, printed in the second volume of the 'Calcutta Journal of Natural History' ; and some of his discoveries in Entomology have been communicated to the public by the Rev. F. W. Hope, in the eighteenth volume of the 'Transactions of the Linnean Society of London.'

He was most especially remarkable for the philosophical spirit in which he invariably prosecuted his researches, and for the patience with which he watched the most minute phenomenon which appeared to him connected with the subjects of investigation. Some of his published papers, especially those on Vegetable Impregnation, and the Progressive Development of Organs, have never been excelled, and rarely equalled.

The merits of this accomplished naturalist and devoted labourer in the field of scientific discovery, were appreciated and fostered by the noble President of this Society while at the head of the Government of India, and it is to his Lordship's kindness that the Society are indebted for some of the most interesting parts of the foregoing communication. His loss was also recently noticed in terms of deep regret by the present Governor-General, Sir Henry Hardinge, in His Excellency's Address at the annual distribution of honours and prizes at the Bengal Medical College.

As it is understood that the whole of the valuable materials prepared and collected by Mr. Griffith, are consigned to the Directors of the East India Company, the most confident hopes may be cherished that the expectations of the scientific world will not be disappointed of the full benefit which they are calculated, and were intended by him, to confer on botanical and zoological knowledge ; and that the irreparable loss entailed on his widow by his early death, and the sudden extinction of all those hopes of fortune, honour and reward which his extensive knowledge and indomitable energy were so well calculated to raise, will meet with such alleviation as, to the enlightened liberality of the Honourable Court, the great value of his labours, and the forlorn and ill-provided state of his widow and family, may be considered to merit.*

* Reprinted from the July number of the 'London Journal of Botany.'

Notice of the 'London Journal of Botany,' No. 43, dated July, 1845.

With the exception of the memoir of the late Mr. Griffith, extracted from the Proceedings of the Royal Asiatic Society for June, the Articles in this number relate exclusively to Exotic Botany; the titles are given below.

'Contributions to the Botany of South America.' By John Miers, Esq., F.R.S., F.L.S.

'A Description of *Ophiocaryon paradoxum*, or the Snake-Nut Tree of Guiana;' by Sir Robert Henry Schomburgk, K.H., &c., &c.

'Botanical Excursion to Solinas, an Indian village on Chimborazo;' by Professor William Jameson.

'Botanical Information. Boissier. Spanish Botany: Excursions round Malaga, &c.'

Proceedings of Societies.

BOTANICAL SOCIETY OF LONDON.

June 6, 1845.—Dr. Bossey, V.P., in the chair.

Dr. W. H. Harvey, of Trinity College, Dublin, presented some plants from the Cape of Good Hope, and British plants had been received from Mr. Andrews, Mr. West and Mr. Lukis.

Dr. Ayres presented specimens of a barren state of *Agaricus androsaceus*, L., which had been submitted to the Rev. M. J. Berkeley for his opinion. This state consists simply of fine brown filaments attached to dead leaves, more particularly those of the beech. Mr. Berkeley states that similar modifications of other Agarics have been found.

Read the commencement of a paper being "Memoir on the Phenomena of the colouring of the Waters of the Red Sea," translated by H. O. Stephens, Esq. from a paper by Dr. Montagne, read before the Academy of Sciences at Paris.

July 4, 1845.—J. E. Gray, Esq. F.R.S.L., President, in the chair.

Donations to the Library were announced from the Boston Natural History Society, and Mrs. Atkins. Mr. C. E. Broome presented some specimens of British Fungi, and British plants had been received from Mr. A. Croall.

Read the conclusion of the paper commenced at the late meeting, being "Memoir on the Phenomenon of the colouring of the Red Sea," translated from a paper by Dr. Montagne, by H. O. Stephens, Esq.

A specimen of *Trichodesmium Ehrenbergii*, from the Red Sea, was exhibited under the microscope.—G. E. D.

Account of a Botanical Excursion to Ailsa Crag, in July, 1844. By J. H. BALFOUR, M.D., F.L.S., Regius Professor of Botany in the University of Glasgow.*

At a previous meeting of the Society, Mr. Keddie gave an account of a botanical trip to the Bass Rock, that remarkable trap island which lies on the east coast of Scotland, and by way of contrast I now propose to give a short notice of an excursion made about a fortnight afterwards to Ailsa Crag, an equally, or perhaps still more remarkable island on the west coast.

Our party, consisting of myself and seven pupils, viz.: Messrs. F. and O. G. Adamson, Caldwell, Craig, Risk, Stevenson and Connal, left Glasgow on Friday, 21st July, 1844, by an afternoon railway train for Ayr, where we went on board the Stranraer steamboat. The weather was propitious, and we had a fine view of the Ayrshire coast as we skirted along. Greenan Castle, the Heads of Ayr, Dunure Castle and Culzean Castle were among the objects of interest which we noticed. We reached the rocks called the Maidens in the evening, having previously arranged that a boat should be in readiness to take us ashore. The landing here is by no means easy in rough weather, and even when calm, the shallowness of the water on the sandy beach prevents a boat of large size from landing its passengers comfortably. Having secured quarters at Kirkoswald, we proceeded along the shore to Culzean Castle. On the way we picked *Atriplex laciniata* and *rosea*, *Salsola Kali*, *Polygonum Raii*, *Convolvulus Soldanella*, *Mentha sativa*, *β. rubra*, *Agrimonia Eupatoria*, *Habenaria viridis*, *Eryngium maritimum*, *Ribes nigrum*, *Carex arenaria*, *Ammophila arenaria*, *Pyrethrum inodorum*, *β. maritimum*, *Zostera marina* and several sea-shore plants. Leaving the shore, we proceeded to the woods of Culzean, where *Epipactis latifolia*, *Campanula latifolia*, both blue and white, *Epilobium angustifolium*, *Listera ovata* and *Symphytum officinale* were gathered. A visit was paid to the pond, which is frequented by a great number of interesting species of water-fowl, and we afterwards directed our steps towards the castle. Culzean Castle was founded by David, late earl of Cassilis, in the year 1777. It stands on a rock which rises perpendicularly out of the sea to the height of 100 feet. It is interesting both as regards its architecture and the splendid view which it commands of the Frith of Clyde and of Ailsa Crag. On the fort at the castle there is a cannon marked as being of the time of Charles I. There are several remarkable caves in the rock, some of

* Read before the Botanical Society of Glasgow.

them extending nearly 200 feet. The gardens, which have been formed in a terraced manner out of the rock, produce many rare and showy plants. The nature of the climate allows some delicate plants to thrive well. The woods in the neighbourhood are beautiful and picturesque, and extend over several hundred acres of ground.

After a complete examination of the castle and grounds, we proceeded to our evening quarters at Kirkoswald. The inn, kept by a person of the name of Campbell, was by no means capacious, and we had to adopt various contrivances with the view of getting beds, and with all our efforts, I fear that several of our party slept very little. The inn-keeper and his wife, however, did all in their power to promote our comfort.

Saturday, 27th July, 1844.—Rose at half-past 2 this morning, and after arranging the provisions which we were to take with us, we proceeded to the Maidens, and between 3 and 4 o'clock set sail in two boats for Ailsa Crag. There was a light breeze when we started, and by means of sails we were enabled to make way. The breeze, however, not being in our favour, we were forced to make towards Arran with the view of afterwards running down on Ailsa. But ere long the wind fell, and there was a complete calm, so that we were compelled to have recourse to oars. The day was beautiful and the sea was like a lake, and all we wanted to make us enjoy our sail was some means of propelling the boats rapidly through the water. Each took his turn at the oars, but in spite of our exertions we did not reach the rock till 11 o'clock. The distance of Ailsa from the Maidens in a direct line is about fifteen miles, but by our tacking we increased the distance much. The nearest point where a boat might be procured is Girvan. We landed on the eastern side of the rock, which is the only part accessible to boats. The shore here consists of rolled pebbles, which have been thrown up by the waves of the sea. Near the landing-place there is a house for the use of the tacksman of the island, who accompanied us, and who showed us every attention. At this habitation we got breakfast prepared, and we sat down in the open air to a rude but most acceptable repast. The day was remarkably fine, and we were enabled to make a complete survey of the Crag.

Ailsa, although one of the most interesting objects in the Frith of Clyde, is not often visited by tourists. Its distance from the shore and the want of any regular means of conveyance have contributed in no small degree to prevent strangers from viewing the grand and majestic scenery of the island. The rock rises suddenly from the sea to the

height of nearly 1100 feet. It assumes a conoidal form, and is said to be upwards of 3000 feet in length and 2000 in breadth.

In our examination of the Crag we first proceeded along the loose shingles of the shores towards the point where we meant to ascend. There is only one side on which the ascent can be made, all the others being bounded by perpendicular cliffs. The ascent is by no means easy, owing to the loose rocks and stones which are scattered over the sides of the island. The rocks are easily detached, and on this account great caution is required in passing over them. A boy, it appears, was killed in the spring by the fall of some of these loose masses of rock. After reaching a height of about 200 feet, we came to the ruins of an old square tower, with some arched chambers, which are still entire. The history of this tower does not seem to be known.

The vegetation of the island we found to be of a remarkably luxuriant nature, but to be very limited as regards species. The plants which form the herbage of the Crag near the tower, are *Lychnis diurna*, both pink and white, *Silene maritima*, *Teucrium Scorodonia*, *Rumex acetosa* and *Acetosella*, and *Senecio Jacobæa*. The two first-mentioned species attained a remarkable size, and with their showy pink and white blossoms added much to the beauty of the vegetation. On some of the rocks *Cotyledon Umbilicus* grew in great luxuriance, attaining a height of nearly two feet, with its leaves large in proportion. Macculloch probably mistook this for *Hydrocotyle vulgaris*, which was not seen to attain the large size mentioned by him. There are some springs of water on this side of the crag, and in marshy spots we found *Scirpus setaceus* forming a complete turf. There are numerous rabbits and a few goats and sheep on the island.

On reaching the summit of the rock we had an extensive view of the surrounding coasts, and were amply repaid for our toil in ascending. After examining the upper part of the Crag and admiring the scenery, we descended to the shore again, and then proceeded by the bottom of the cliffs to the southern part, and as the tide was low, we were enabled to make a complete circuit of the Crag. The shore is a very narrow belt, covered with debris of fallen rocks, and ending abruptly in very deep water. The cliffs are on a grand scale, and extend from the south round by the west and towards the north side. In most instances they assume a columnar form. A good representation is given of them in Macculloch's 'Description of the Western Islands of Scotland.' The precipices rise to the height of 400 or 500 feet, and the columns are stated by Macculloch to be 400 feet in height in many places, thus far exceeding the columns of Staffa, which

are only 60 feet high. They want, however, the regularity and the defined forms which the rocks at Staffa present; but they have less of the dark and gloomy aspect of the latter. They are covered with innumerable tribes of birds, especially gannets or solan geese, gulls, cormorants, auks and puffins. The firing of a gun caused the air to be darkened by the birds. The young geese are prized by some as an article of diet, and a rent is paid for them. They require to be cooked in a particular manner in order to render them at all palatable. The tacksman of the island employs people to capture the young birds, and there is no small risk incurred in doing so. We saw some men engaged in taking the birds on a narrow ledge of rocks, which they had reached by being let down by ropes from the summit. Every now and then the rocks crumble and give way, so as to add much to the danger of this perilous undertaking.

The rocks of the island consist of a porphyritic sienite, which is sometimes amorphous and sometimes columnar. The basis is felspar, with small grains of quartz and sometimes hornblende interspersed. We observed numerous trap veins traversing the rocks, and occasionally fine caves are formed. One of these caves occurs towards the northern part: it is about twelve feet wide, between twenty and thirty feet in height and extends about fifty feet. *Asplenium marinum* lined its walls, and near its entrance magnificent specimens of *Cochlearia officinalis* were picked, with the leaves $4\frac{1}{2}$ inches in diameter. The luxuriance of this and the other plants in the island may depend in part on the dung of the sea-fowl, which serves as excellent manure when applied in moderate quantity. At the foot of some of the cliffs there is a large accumulation of black mould, mixed with the dung of sea-fowl and the remains of numerous birds that have fallen from the cliffs. The ammoniacal odour arising from these sources under the influence of the sun's rays, was very powerful. The wet nature of the climate prevents the guano from accumulating in large quantity so as to render it an object of importance. Some of the soil was analysed by Dr. R. D. Thomson, and was found to contain a notable quantity of ammonia. Where the guano existed in the greatest quantity there was scarcely any vegetation, and it was only where the manure was sparingly applied that the plants assumed the luxuriance which I have described.

On the rocks in the south of the island we picked *Lavatera arborea* and *Sagina maritima*. The former of these plants occupies many inaccessible ledges on the cliffs, and it is curious to remark that it is found both on the Bass rock and on Ailsa. *Raphanus maritimus* was

also seen on the cliffs, as well as *Angelica sylvestris* and *Erodium cicutarium*. The rocks on the shore are covered with masses of seaweeds, and we noticed all the more common species in profusion.

Towards evening a brisk breeze sprung up, and we left the island at 6 o'clock, P. M., with all our sails set, and reached the Maidens in two hours, not, however, without some of the party suffering all the horrors of sea-sickness. From Kirkoswald we walked to Maybole, where we took up our quarters for the evening. The only plant of interest which we noticed was *Rumex alpinus*. On our way we passed some antiquarian remains, among which may be noticed the Abbey of Crossraguel, situated about two miles from the village of Kirkoswald. It was founded by Duncan, king of Scotland, in 1260, and is said to be more perfect than any abbey in the west of Scotland. The side walls of the church and choir still remain to the height of fourteen feet. The niche for the altar, the vestry, the abbot's ecclesiastical court and house are all visible.

In Maybole parish there are several chalybeate springs, and there are some excellent wells. From the sloping grounds on which the town is built, and which consist of strata of red sandstone, springs of the purest water gush out in abundance and contribute to the health and well-being of the inhabitants. We visited one which is called Well Trees Spout. It is situated at the base of the declivity on which the town is built, and is overhung by some old trees. The stream which flows is sufficient to drive the wheel of a mill, and the spring is said to discharge not less than 10,000 imperial gallons per hour.

On Monday the 29th we returned to Glasgow by Ayr, after having enjoyed a most delightful botanical trip. Although there were few rare plants collected, yet we had the pleasure of visiting a previously unexplored island and of ascertaining with tolerable accuracy its floral productions.

CATALOGUE OF PLANTS COLLECTED ON AILSA CRAG.

<i>Ranunculaceæ.</i>	<i>Caryophyllaceæ.</i>	<i>Trifolium repens</i>
<i>Caltha palustris</i>	<i>Alsine marina</i>	<i>Rosaceæ.</i>
<i>Ranunculus Flammula</i>	<i>Cerastium triviale</i>	<i>Fragaria vesca</i>
— repens	<i>Lychnis diurna</i>	<i>Potentilla Tormentilla</i>
<i>Cruciferaæ.</i>	<i>Sagina maritima</i>	<i>Rosa canina</i>
<i>Arabis hirsuta</i>	— procumbens	<i>Onagraceæ.</i>
<i>Cochlearia officinalis</i>	<i>Silene maritima</i>	<i>Epilobium montanum</i>
<i>Raphanus maritimus</i>	<i>Stellaria media</i>	— palustre
<i>Violaceæ.</i>	<i>Geraniaceæ.</i>	<i>Haloragiceæ.</i>
<i>Viola canina</i>	<i>Erodium cicutarium</i>	<i>Callitriche verna</i>
<i>Polygalaceæ.</i>	<i>Leguminosæ.</i>	<i>Portulacaceæ.</i>
<i>Polygala vulgaris</i>	<i>Lotus corniculatus</i>	<i>Montia fontana</i>

Crassulaceæ.
 Cotyledon Umbilicus
 Sedum anglicum
Saxifragaceæ.
 Saxifraga hypnoides
Araliaceæ.
 Hedera Helix
Umbellifera.
 Angelica sylvestris
 Hydrocotyle vulgaris
Caprifoliaceæ.
 Lonicera Periclymenum
 Sambucus nigra
Rubiaceæ.
 Galium Aparine
 ——— saxatile
Compositæ.
 Arctium minus
 Bellis perennis
 Carduus lanceolatus
 ——— tenuiflorus
 Hieracium murorum
 Hypochaeris radicata
 Oporinia autumnalis
 Senecio Jacobæa
 Sonchus oleraceus
Campanulaceæ.
 Jasione montana
Ericaceæ.
 Erica cinerea
Scrophulariaceæ.
 Euphrasia officinalis
 Veronica Chamædrys
 ——— officinalis
Labiata.
 Prunella vulgaris
 Teucrium Scorodonia
 Thymus Serpyllum
Boraginaceæ.
 Lycopsis arvensis
 Myosotis arvensis
 ——— collina
Plumbaginaceæ.
 Armeria maritima
Plantaginaceæ.
 Plantago Coronopus
 ——— lanceolata
 ——— maritima

Chenopodiaceæ.
 Atriplex rosea
Polygonaceæ.
 Rumex acetosa
 ——— Acetosella
 ——— crispus
Urticaceæ.
 Urtica dioica
 ——— urens
Liliaceæ.
 Hyacinthus non-scriptus
Fluviales.
 Zostera marina
Juncaceæ.
 Juncus supinus
Cyperaceæ.
 Scirpus setaceus
Gramineæ.
 Agrostis alba
 ——— vulgaris
 ——— v. pumila
 ——— canina
 Aira flexuosa
 Anthoxanthum odoratum
 Arrhenatherum avenaceum
 Festuca duriuscula
 ——— ovina
 Holcus lanatus
 Poa annua
Filices.
 Asplenium Adiantum-nigrum
 ——— marinum
 ——— Ruta-muraria
 Lastrea Filix-mas
 ——— dilatata
 Polypodium vulgare
 Pteris Aquilina
Musci.
 Anomodon curtispiculum
 Bartamia fontana
 Bryum alpinum
 ——— argenteum
 ——— capillare
 ——— palustre
 Dicranum scoparium
 Hypnum cupressiforme
 ——— sericeum
 ——— stramineum

Hypnum triquetrum
 Pterogonium gracile
 Tortula fallax
 Trichostomum lanuginosum
Marchantiaceæ.
 Marchantia hemisphærica
Jungermanniaceæ.
 Jungermannia dilatata
 ——— Tamarisci
 ——— ventricosa
Lichenes.
 Collema cristatum
 Cladonia furcata
 ——— pyxidata
 ——— rangiferina
 Lecidea geographica
 ——— sp. with small black
 apothecia
 Lecanora candelaria
 ——— parella
 Parmelia aquila
 ——— compressa
 ——— furcata
 ——— blivacea
 ——— parietaria
 ——— saxatilis
 Ramalina scopulorum
 Sphærophoron coralloides
 Sticta pulmonaria
 ——— scrobiculata
 Usnea plicata
Algæ.
 Alaria esculenta
 Chondrus crispus
 Chorda Filum
 Conferva rupestris
 Delesseria sanguinea
 ——— alata
 Dichloria viridis
 Desmarestia aculeata
 Enteromorpha intestinalis
 ——— compressa
 Fucus nodosus
 ——— serratus
 ——— vesiculosus
 Himanthalia lorea
 Laminaria digitata
 ——— saccharina

Odonthalia dentata
 Plocamium coccineum
 Polysiphonia fastigiata

Porphyra vulgaris
 Ptilota plumosa

Rhodomenia palmata
 Ulva latissima

On viewing the list it will be seen that the phanerogamous plants collected represent 33 natural orders, and amount to 79 species and one variety. The list of cryptogamic plants is by no means complete, partly from the short time allowed for the examination of the island and partly on account of many of the mosses and lichens not being in fructification. There were observed 7 species of ferns, 14 mosses, 4 Hepaticæ, 19 lichens and 14 sea-weeds, making in all 68 cryptogamic species. It will be remarked that the ferns are in the proportion of 1 to about every 11 of the flowering plants; and taking phanerogamous plants and ferns together, the latter will form nearly 1-12th of the species.

J. H. BALFOUR.

Glasgow, June, 1845.

Cursory Thoughts on the Philosophy of Botany. By EDWIN LEES, Esq., F.L.S., &c.

I HAVE frequently had to complain, either orally or in writing, of the contempt cast upon the "mere botanist,"—a favourite term used by professed philosophical writers, as if there was something paltry and senseless in the pursuit of Botany itself, technically considered;—something so very mechanical, that *thought* was never called forth by it, *reflection* never aroused, or *truth* sought for or arrived at. Such ideal degradation of labourers in other walks than their own, if not excusable, may be accounted for; but surely the unkind aspersion should not come from the practical botanist to his own brethren. Mr. H. C. Watson, has, in some of his late papers, however, rather unnecessarily fallen foul upon the humble yet perhaps not altogether inutile tribe of plant-collectors, who, as observers and recorders of "unconsidered trifles," are denominated hair-splitters, and species-splitting monomaniacs.* This seems rather unqualified language to apply to poor wandering simplers after rifling their stores! As Mr. Watson's name is so deservedly honoured among British botanists, I presume he has a license, like the heroes of old, to brandish his battle-axe on all sides without let or hindrance, though almost as much to the terror of friend as foe; but in his last flourish it has so nearly fallen upon my own toes, that if no one else calls out, I must.

* Phytol. Vol. ii. pp. 161, 219.

"What are we to say," observes Mr. Watson "about the frivolous attempts at species-making among the Rubi and Polygona in vogue at present, as among the Rosæ and Menthæ in former years?"* I adduce this sentence, though the last on the record, as rather coming home to myself from having laboured at what Mr. Watson thus by implication condemns, and object entirely to the spirit in which it is written. Why should it be esteemed more frivolous to attempt unravelling the intricate forms of the Rubi, than to sow primrose-seeds and make varieties of their produce? If Mr. Watson will really allow thought on the subject, by others as well as by himself, then I should be disposed to say, that not only were the observers of Roses in times past doing good service to Botany, but that the observers and describers of Rubi and Polygona, as well as the experimenters on the permanent characters of species in any family, are doing so now.† Mr. Watson's remarks tend to repress observation except in his own way; but surely knowledge is only to be obtained correctly by unrestricted observation on all sides.

But why this objection to "species-making,"—or rather the observation of minute differences in plants? If this minute attention be not given, do not the greatest mistakes arise? If, then, an individual plant differing from another in some particular point is not to be noted, why attend to species at all, or attempt to set bounds to them? Better at once say with Thomson, as we contemplate the flowery meadow and its grasses, "beyond the power of botanist to number" up their forms. But if Mr. Watson admits the discovery or designation of species to be advantageous, then why decry that attentive examination of them which every tyro in Botany has been taught it is important to attend to? But here we come to the *opprobrium botanicum*—the definition of species so carefully constituted as to form what Mr. Wat-

* Phytol. ii. p. 219.

† I wish botanical writers would exercise a little more candour and forbearance as well as due appreciation towards their compeers and fellow-labourers than is usually the case, and not at all events attribute any depreciating motive as influencing their labours—if they can help it. Yet alas! somebody or other has always to complain on this score. Sir James Smith murmured at Dr. Hooker's making nought of all his efforts on the willows, and the latter possibly thinks he may have been slighted in his turn. Dr. Lindley warmly reproached the friends of Sir J. E. Smith with not allowing him to participate in the spoils of the Rubi, as he says they "determined to keep the game in their own hands;" yet he himself with equal injustice denounced the school of Linnæus as an "incubus upon science," and as leading to no one useful purpose. Now Mr. Watson comes to the charge, blaming botanists for "love of approbation," or as seeking notoriety, and I, in my turn, grumble at his uncharitableness!

son calls an "impassable barrier between varieties and species." If this is not to be expected or attainable, then an arbitrary boundary must be proposed, subject to the influences of observation and experiment; and this really renders it expedient that at one time a variety should be named as a species, and at another a supposed species subside into a variety, just as the evidence before an observer preponderates one way or the other. If this be inconvenient to the systematist or botanical statist, it must be submitted to, till it has been decidedly shown what are the characters to distinguish species from variety in every natural family.

It is doubtless true, as remarked by Fries, that small is the difference that depends upon a hair, and yet a hair's breadth may be a sufficient line of demarcation between safety and destruction, and therefore not quite to be despised. But until botanists have decided what is absolutely essential to specific distinction, and what is not so, in every family, we may be justified, I think, in attending to minute characters, and noting them, until extended observation produces conviction of truth or error. But is not the variety of Nature's productions a source of the most ravishing delight, and the contemplation and examination of her numerous vegetable forms a pursuit well worthy of our attention, as giving rise to mental pleasure, and exercising the perceptive faculties? Our predecessors in the field, indeed, have only left us in our own country the gleanings of the harvest; but let us not rest satisfied that they have done all that can be accomplished, but carefully look out for ourselves. Some botanists appear displeased with Nature because she smiles at the rules of art, and hence they would, if possible, fetter her within their own definitions. In their capriciousness they will expand some genera agreeable to them with well-turned species, but others must remain locked up with all their inmates, and no liberty is to be allowed *them*. How many fresh delights have opened upon me since I studied minutely the characters of the Rubi, unchilled by the remark too often made on every hedge, that it is only *Rubus fruticosus* that is there! And as to the objection of an herbarium's containing too many specimens of varieties or supposed species, I am of opinion that it is only by the study of numerous specimens that a fair judgment of the claims of any species can be arrived at, and that it is injudicious to found a species upon a single specimen only.

I think also, that it is unfair to contend sweepingly that botanists in general are guided in all they do by a "love of approbation" or notoriety-seeking. This is not *my* experience of my own botanical

acquaintance, and many have I known whose love of Nature's beauties was as enthusiastic as it was modest, unassuming, and unaffected. Perhaps there may be occasionally professional aspirers, who, anxious to gain the top of the tree, may be careless of disarranging its branches, if the rustling they make only brings them into notice ; such a casual disturbance may knock the dry sticks about our heads, and call for Mr. Watson's reprobation ; but such an annoyance from notoriety-seeking, if that be the only motive, is not likely to be of long continuance, nor are the whole body of practical botanists to be held responsible for it. Without insisting upon the principles of phrenological development in the matter, I should judge the feelings of the botanical rambler to be instigated first by the *love of novelty*, for this is common to us all, and to "range in fresh fields and pastures new," or gather for the first time, as Lucretius says, "new flowers," is exciting even to the uninitiated.

"Tis not for nothing that we life pursue,
It pays our hopes with something still that's *new*."—*Dryden*.

The love of knowledge follows upon the excitement of novelty, and we hasten to understand what we have discovered ; and surely it is but cold comfort in return for our efforts to be told that instead of having progressed in knowledge, we only show our deficiency in reasoning powers, but have the bump of notoriety well developed ! It would, I think, be but charitable to infer that in most instances truth is sought after ; for if a plant be found really not answering to recorded descriptions, I cannot but think it deserves to be noted, even if it eventually turns out that it is the description only which requires correction. Instead, therefore, of Mr. Watson's too sweeping condemnation of "species-making," as he terms it, I would propose a resolution by way of amendment, restricting all *young* botanists from publishing new names till they had studied the science for at least five years, and preserved their specimens for examination and criticism. But I think if a person has made any class, family, or genus, his peculiar study for upwards of five years, it is but fair to infer that he has found out something, and if so, let us by all means have the benefit of his labours, even if a change of names or a new species does result in consequence.

That the term *species*, as Mr. Watson suggests, requires a more extended definition, or recasting, may be correct ; or rather perhaps the characters on which a species is supposed to depend, are not the

same in every family, and hence a too rigorous form of words will be in all cases inapplicable.* Certainly, I think this requires to be looked into, for if characters are employed to determine species which are variable in themselves, the fault rests in the employment of this exceptionable character. Thus the involucre were formerly employed to determine the species of the Umbelliferæ, and *Cœnanthe pimpinelloides* was described to have a general involucre, while *Cœnanthe peucedanifolia* had not. From this unimportant point being regarded numerous errors have arisen, and the two plants became confounded, and the former even erased from the British Flora by Mr. Babington; and yet their *roots* show them to be perfectly distinct, and this character is constantly available, and probably may be most discriminative in all the Umbelliferæ, the *roots* of which are most important to mankind, though in some other orders this character may be of no account. So that whatever may be asserted about the oat changing into rye, I think all the ingenuity of the greatest advocate of transmutation would not be able to effect the change of a parsnip into a carrot, or induce the *Cœnanthe phellandrium* to become a celery. Only then find out the character that is really the most important in an order or tribe, and much doubt and confusion is removed, and we find indications of permanent boundaries in Nature *there*, at any rate.

In the rose tribe Nature appears most capricious; root, leaves, armature and fruit all fail us at need as unerring absolute characters; yet surely the *attempt* to discriminate between the variable forms that occur is not to be despised, because in the effort truth may be arrived

* Whatever theory may suggest, *practically*, botanists are right in separating as *species* plants of the same family that have *permanent palpable differences* in a wild state in *some particular character*. It is obviously impossible for a travelling collector to make experiments, and any assumption on his part could only be productive of error. Experimental botany should be considered a separate department, and let the experimentalist make his claims to regulate or modify specific nomenclature, as the lawyers say "without prejudice." With respect to *varieties*, there is perhaps more anomaly and ambiguity than even in species, since no weight appears to be bestowed upon the relative amount of variation, and thus almost every botanical author's "Alpha—Beta—Gamma"—is different to that of others, giving rise to whole columns of synonyms. Now this really requires emendation. *Transient* varieties, therefore, should be distinguished from permanent ones, and rules laid down for this purpose. A plant with an additional petal or two, a white-blotched or fissile leaf, or a white flower instead of a coloured one, though curious, is rather a *sport* or *luxuriation*, than a variety, and does not deserve to be estimated in the same manner as more important and continuing characters would, affecting the appearance of the whole plant. Hence varieties ought to be classed as *casual* or *permanent*.

at, and this would be an abundant reward of all past labour. Besides, in such a labyrinth a proposition must at first be made, and experience will eventually decide as to its correctness; but assumption without proof, that an alleged species is only a variety, ought to be reprobated in every case. The boundaries of species both in the genera *Rosa* and *Rubus* are not yet perfectly ascertained, and therefore I cannot agree with Mr. Watson that the attempt to ascertain these boundaries is "frivolous." Neither, if the usual definition of species will not apply in every family alike, is it philosophical to give up the term as useless and "fall into the transition-of-species theory." For in some families there may be and is a transition of one form into another to a limited but not a constantly progressive extent, just as the river winds in a thousand sinuosities to reach the ocean, its waters by evaporation again returning to the mountains to pass over the same windings as before. So in every tribe of plants, the seed more or less may have power to sport whether in leaves, flowers, or fruit, to an extent perhaps unknown or unascertained, but not unlimited; it can only go through the changes providentially assigned to it; in its seed again brought back to its old position. This is to be particularly borne in mind, for these restricted changes by no means oblige us to side with the never-ending transmutation theory. The *Vestigians* would infer that certain metamorphoses which we see confined in their range, prove former transmutations which we have not witnessed, and that to an unlimited extent. But this is most fallacious reasoning, for all the varieties, for instance, that horticulture shows us in the *Dahlia* or the *geranium*, even if exhibited in a wild state, could give us no just reason to believe that *something else* other than the seed of a *Dahlia* or *geranium* had given rise originally to them, and that they would eventually spur on to ulterior developments different from their present family appearances. Because *Tilia Europæa* and *parvifolia* may, as I believe is the case, be the same species under different phases of growth, and the character of the leaf in the lime may be therefore variable, it would be absurd to suppose that because we must alter our definition in *this* respect, our confidence ceases as to the *Tilia* really remaining one, and that we may rationally look out for something else arising from the transmutation of its roots, when it falls or is cut down.

It may be inconvenient to find that Nature does not respect our definition of species in every case, and that thus between the primrose and the cowslip she *will* sport into oxlips, stalked primroses, or red cowslips; but it being once established that it is so, from repeated

observations, the difficulty ceases there, and we find that the oxlip cannot be placed as a permanent species, alternating as it does between, and producible from either the cowslip or primrose. Other families may be found to present similar anomalies, and let observation go on detecting them wherever they are perceivable, and thus we may eventually know the extent of Flora's sportive footsteps. But wherever these may lead us, let us not be afraid of finding out the truth, or attempt to repress observation as "frivolous" in any department, from the fear of our science becoming too complicated, or that it will oblige us to remodel our definitions. Would, indeed, that in numerous cases they were remodelled, for too often, it is not the thing itself that is obscure, but the dark cloud of obscure words in which its description is clothed! Here we have to grope as in a darkened gallery, where the windows have been purposely closed up for solemn effect, and we can only find our way by the aid of the friendly chinks unintentionally left open. This is too often the effect of a long laboured description.

But to come to an end of these "cursory thoughts," I cannot but remark, that whatever sports and floral variations may be detected by the experimentalist in Phytology to a bounded extent, we need not fear that the grand principle of the general identity and permanence of species can be broken in upon or materially disturbed. We may not in every case find the "impassable barrier" Mr. Watson desires between species and varieties, but we may detect the species that do vary, and like the oscillations of the pendulum, note the extent of their utmost variations. This will assist our judgments in doubtful cases; and instead, therefore, of checking observation from the idea that all is done that can be done in British Botany, I believe that much remains to be effected, and something perhaps to be undone. While, then, I would wish observers to be cautious, undogmatical, truth-seeking, and not unconscious of what others have done before them, I believe we shall only profit by an increase of observers and an increase of observations, which, whether arising from a "love of approbation" only, as Mr. Watson suggests, or from a love of science and truth, as I would myself sincerely hope and believe, is really of no account, if science ultimately progresses in consequence.

EDWIN LEES.

Henwick, near Worcester,
July 8th, 1845.

*Report of the Meeting of the British Association, extracted from the
'Athenæum,' No. 923, dated July 5th, 1845.*

SECTION D.—ZOOLOGY AND BOTANY.

THE REV. L. JENYNS read a paper 'On the Turf of the Cambridgeshire Fens.'—This turf was not formed by Sphagnum, as most peat, but from various species of aquatic plants which had been accumulating for a long period of years above the remains of forest trees which lie buried at the bottom of the moor. There are two distinct kinds of turf, the *upper* and the *lower*. The former is the more compact and heavy of the two. The latter consists entirely of the bark, wood and branches of the submerged trees. The turf is not now rapidly formed on account of the improved system of drainage. Formerly it was supposed to grow about twenty inches in sixteen years.

DR. FALCONER said, that he had observed in Cashmere, at the bottoms of lakes, turf of a very similar kind to the lower bed just mentioned. It consisted of the remains of various aquatic plants, as Chara, Potamogeton, Utricularia and Nelumbium. The inhabitants obtained it from the bottom of the lake by means of a rake, and used it as fuel.—MR. BABINGTON stated that the character of the Scotch and Irish bogs was different from that of the fens of Cambridgeshire. He had seen peat procured in Ireland from the bottoms of ponds in the same way as described by Dr. Falconer in Cashmere. MR. H. E. STRICKLAND had seen peat in Ireland converted into a substance as hard as jet, so that it might be used by the turner. The formation of this peat threw much light on the formation of coal. There could be no doubt that our coal beds were some of them formed in the manner of bogs, whilst others resulted from vegetable matter deposited at the bottom of the sea.—MR. SELBY had seen peat quite solid and bright as amber.—THE BISHOP of NORWICH stated, that the trees buried in the bogs of Lancashire exhibited marks of being burnt, and many of them had on them the strokes of the axe.—MR. DOWDEN pointed out the remarkable fact in Mr. Jenyns's observations that the light turf was undermost. The laws of nature were better observed in Ireland, where the heaviest turf was at the bottom.—MR. MURCHISON remarked, that it was an extraordinary fact that there were no bogs in Russia, and yet throughout that country there was a great extent of mountain limestone as in Ireland, the most boggy country in the world. He supposed it was attributable to the character of the climate. In Ireland it was always raining, and moisture favoured the

development of bogs.—Mr. R. BALL, of Dublin, had lately observed a number of trees which were blown down in 1839, covered over with grass, and the interspaces between the trees was filling up with vegetable matter, and in the course of time he believed they would form a bog.—Prof. OLDHAM, of Dublin, observed, that there was a difference in the mountain limestone of Ireland and Russia, inasmuch as the former was covered with beds of clay, and it was on these clay beds that the bogs were formed.

Sir R. SCHOMBURGK read a description of the Murichi, or Ita Palm, of Guiana. This tree grows from the Llanos of Cumana to the western tributaries of the Rio Negro and the mouth of the Amazon, or over an area of 550,000 square miles. It was called by Father Gumilla the *arbol de la vida*, or tree of life, on account of its various uses. It is of the greatest importance to the inhabitants of the country in which it grows. The trunk and its leaves are used for various household purposes. The sap is a saccharine fluid, much drunk by the natives. The flowers afford a sweet fermentable liquid, resembling champagne. The pith of its trunk affords a kind of sago. Even in its decay, this palm is of use, and affords a delicacy to the Indians, which likewise many colonists do not refuse, namely, the larva of a large beetle. The *Curculio palmarum* is found in large numbers in the pith when the trunk is near its decay, and which, when boiled or roasted, resembles in taste the marrow of a beef-bone. Its average height is about 50 feet, and it has been observed growing at a height of 3000 to 4000 feet above the level of the sea.

Prof. ALLMAN laid before the Section a monstrosity occurring in *Saxifraga Geum*. The three external verticils of the flowers were normal, but between the stamens and pistil there was developed a series of adventitious carpels crowded upon the margin of a cup-like production which surrounds the lower half of the pistil. These adventitious carpels were characterised by their backs being turned towards the axis of the flower. The carpels bear ovules on their margins, which acquired a very considerable degree of development, becoming completely anatropous, like those of the normal ovary. Dr. Allman explained this monstrosity by supposing the existence of a series of secondary axes, which are given off in a whorl between the stamens and the primary axis of the flower. These axes terminate in imperfect flowers, of which the additional carpels are the only remains.

Prof. HENSLOW exhibited a specimen of *Papaver orientalis*, in which the filaments of the stamens were converted into bodies bearing ovules.

Prof. E. FORBES read a paper 'On the Distribution of Endemic Plants, more especially those of the British Islands, considered with regard to Geological Changes.' The author stated that the hypothesis of the descent of all the individuals of a species, either from a first pair, or from a first individual, being assumed, the isolation of assemblages of individuals from those centres, and the existence of endemic or very local plants remains to be accounted for. Natural transport, the agency of sea, rivers, and winds, and carriage by animals or through the agency of man, are means in the majority of cases insufficient. The true cause the author proposed to seek in an ancient connexion of the outposts or isolated areas with the original centres, and the subsequent isolation of the former through geological changes and events, especially those dependent on the elevation and depression of land. Selecting the Flora of the British Isles as a means of testing his theory, he divided its vegetation into five Floras: first, a west Pyrenean, confined to the west of Ireland, and mostly to the mountains of that district; second, a Flora related to that of the south-west of France, extending from the Channel Isles across Devon and Cornwall to the south-east, and part of the south-west of Ireland; third, a Flora common to the north of France and south-east of England, and especially developed in the chalk districts; fourth, an Alpine Flora developed in the mountains of Wales, north of England and Scotland; and fifth, a Germanic Flora, extending over the greater part of Great Britain and Ireland, mingling with the other Floras, and diminishing, though slightly, as we proceed westwards, indicating its easterly origin and relation to the characteristic Flora of northern and western Germany. The author then went into details, pointing out the circumstances which gave a probable age to each of these British Floras, and the geological changes which had occurred to isolate them from Floras of other parts of Europe, with which they were formerly in connexion, and with which they had a common parentage. He maintained, in conclusion, that the peculiar distribution of endemic animals, especially of the terrestrial Mollusca, bore him out in these views. He proposed to pursue the subject in detail, with reference to both animal and vegetable life, in connexion with the researches of the Geological Survey.

This paper produced a long and interesting discussion. Mr. J. BALL argued against the hypothesis of there being only a single species created. If there were but one individual we were not in a position to say what were its characters from our present forms. He saw no objection to the view that the same species might be created at two

distinct periods of time, as well as of space.—Prof. PHILLIPS would not enter into the question of the hypothesis, but as a geologist he could say, that the changes required to produce the isolation of the Floras spoken of by Mr. Forbes, were not greater than must have taken place to produce other well-known geological phenomena. He believed the views of Prof. Forbes of great importance; and, in regard to the examination of the distribution of extinct forms of animals and vegetables, would furnish a mode of investigation of the greatest value.—Mr. C. C. BABINGTON stated, that if the presumed geological phenomena of Prof. Forbes could be granted to have taken place, that would be a strong argument in favour of the hypothesis he had adopted. The great difficulty in the way of supposing the creation of but one individual of a species was their frequent distribution over various parts of the world.—Prof. FORBES, in reply, stated that if the hypothesis of a single pair or an individual of each species were not granted, there was an end to all palæontology and its value in geological inquiry. If the hypothesis of descent be not true, then the deductions of geologists from it are erroneous.

Rus in Urbe. By EDWARD NEWMAN.

(Continued from page 198).

THE hot weather and a direct southern aspect have well nigh terminated my experimental city garden. The heat became intolerable and the loss of plants proportionably great: some few, however, seem to bear any degree of heat, and even now there is a goodly sprinkling of fronds, all of them young and of the tenderest green. Some northern ferns seem well satisfied with the high temperature, while others perish from its effects. As yet, however, my experience in these matters is so limited that I prefer saying but little, since I may very possibly find myself attempting to raise mere casualties to the rank and importance of laws.

* * * * *

I am disposed to believe that our Pteridologists have rarely taken that comprehensive view of the characters of ferns which is requisite for their classification in accordance with nature. It is well known that ferns, in common with other beings, whether animal or vegetable, possess organs tending to two different purposes;—the preservation of the individual and the preservation of its kind: and these purposes, though intimately connected, though the means of their attainment

be so elaborately interwoven that they are often confounded in our short-sighted investigations, are yet, in every instance, found to be distinct if the inquiry be skilfully and carefully conducted. In ferns, it will be at once seen that the roots tend to the preservation of the individual, so also does the stem : under all its names of root, rhizoma, underground stem, caudex, trunk, &c.,* the discerning mind recognises the same organ under a variety of forms. The fructification is obviously a provision for the preservation of the kind, and it may be remarked that it never appears in any degree to subserve the preservation of the individual, but rather tends to its exhaustion and impoverishment. The frond which bears the fructification, may perhaps occur to some botanists as holding a debatable office between the preservation of the individual and that of the kind ; but this view will, I think, be dispelled when we consider that in those ferns, where the fructification occupies the entire surface of some fronds, others, perfectly sterile, are provided, and there can be no doubt that these perform the offices of nutrition, respiration, &c., and therefore, that when a frond is foliaceous, and produces masses of fruit at intervals, the portions not thus occupied may be regarded as subserving the preservation of the individual. In *Botrychium*, *Ophioglossum*, *Aneimia*, &c., we find the frond divided into a fertile and a barren branch, and there is no reason to doubt that the barren branch, not being in these instances required for the perfecting of the fruit, is provided for the service of the plant itself.

Having thus indicated the existence of two classes of functions and the provision of parts adapted to each, on proceeding to weigh the importance of the two, we shall, I think, be inclined to concede the greater importance to those which subserve the preservation of the kind,† and therefore shall consider that botanists have acted wisely in laying so great stress on fructification.‡ I am, however, inclined to think, that the first class of organs has not received that consideration to which it is entitled ; and I could wish to see characters carefully drawn from the direction and form of the rhizoma, the attachment and veneration of the fronds, and the presence, situation or absence of distinct articulation in the stipes. In two, at least, of our British ferns

* Sir J. E. Smith adds the term "runners."

† This subject, however, admits of question, and deserves a more rigid examination than is desirable in this place.

‡ Throughout Zoology we trust almost exclusively to characters derived from parts provided for the requirings of the individual, but I believe not from a conviction of their greater importance.

articulation exists : in *Polypodium vulgare* the joint is at the junction of the stipes with the rhizoma, and I find that every discoloured frond in my little city fernery falls off at the slightest touch, leaving a round scar on the rhizoma. In *Woodsia* the articulation is higher up in the stipes, the disjunction always leaving a portion thereof attached to the rhizoma. In *Lastræa Callipteris* the stipes is long-persistent, its underground portion living many years ; there is no trace of articulation, and separation can only be produced by force. A contrast is often produced in the habit of a species by the character of its rhizoma : thus we see the fronds of *Lastræa multiflora* arranged regularly round a centre, while in *Lastræa spinosa* they are without arrangement : the cause is to be found in the vertical position of the rhizoma in one, its horizontal position in the other. Who that is aware of this remarkably constant distinction could by any possibility confound the species ? In veneration the observant eye will detect great differences, and in no group is this more strikingly displayed than in *Pteris*, as at present restricted. Thus *Pteris tremula* is circinate, while *aquilina* and *caudata* have a distinct form of veneration. Excepting for the more easy distinguishing of species, I am inclined to consider the form of frond unavailable.

On contrasting a vertical with a horizontal rhizoma, an articulate with an inarticulate stipes, a circinate with a simply bent veneration, I find great difficulty in drawing any conclusions as regards the primary grouping of ferns : but it is far different with the fructification, which appears to possess points of structural resemblance throughout groups consisting of many hundred species. I am therefore compelled to consider the diversity of structure in those organs whose function is the preservation of the individual, as minor or secondary characters ; while the diversity of structure in those organs whose destination is the preservation of the kind, are major or primary characters, and in all natural arrangements must take the precedence of the others.

May we not subdivide these primary and secondary characters, and establish subdivisions in each ? For instance, regarding the veins as receptacles, and therefore equal in importance to the receptacles of flowering plants, we cannot fail to observe that the attachment of the capsules is sometimes median, sometimes lateral ; and this appears to me the distinction between *Polypodium* and *Asplenium* as these were formerly understood. Again, the involucre is sometimes present and sometimes absent ; and it requires much careful consideration before we can arrive at any just decision whether this discrepancy

affords a just ground for subdivision, and if so to what amount. In order to judge fairly of the value of characters derived from these sources, let us compare their constancy.

The median or dorsal attachment of the capsules is common to the vast tribe or suborder which comprises the genus *Polypodium* of Linneus. The large section subtracted from the genus by Swartz under the name of *Aspidium*, offers no objection in this respect. The chief groups into which the British examples of this tribe are divisible are these:—

<i>Woodsia</i>	ex.	<i>Ilvensis</i>
<i>Cystopteris</i>	ex.	<i>fragilis</i>
<i>Polystichum</i>	ex.	<i>aculeatum</i>
<i>Lastræa, Presl</i>	ex.	<i>multiflora</i>
<i>Lastræa, Bory</i>	exs.	{ <i>Oreopteris</i> <i>Phegopteris</i>
<i>Polypodium</i>	ex.	
		<i>vulgare</i>

If we carefully examine these, we shall find no exception to the rule that the attachment of the capsules to the receptacle is median or dorsal. But if we turn our attention to the presence or absence of the involucre, the result of the investigation will be widely different. In *Ilvensis* the hairy fringe around the base of the capsules is considered an involucre: in *fragilis* a hoodlike involucre springs from the receptacle at the point where the capsules are attached: in *aculeatum* it spreads like an umbrella over the capsules, standing on a central stipes like a mushroom: in *multiflora* the capsules are about half covered, the involucre being forced on one side, and the capsules protruding on the other: in *Oreopteris* the involucre may be said to have reached a minimum as regards size, when present, but its presence seems rather the exception than the rule: in *Phegopteris* it is so rarely observed that most authors deny its existence, and in *vulgare* I believe no author has asserted that he has found it. Those who are acquainted with exotic ferns are well aware how perfect a series is to be found filling the gap between *aculeatum* and *multiflora*: in some instances the involucre is so exactly intermediate, that it is a most difficult problem to solve whether its attachment is central or lateral. Again, some exotic ferns exhibit the involucre in every intermediate state between that of *multiflora* and that of *Oreopteris*; while others most completely connect *Oreopteris* and *Phegopteris*. It is remarkable, that in *Oreopteris* the same plant will produce fronds with and fronds without involucres, and even the same frond may not unfrequently be found having some of its clusters accompanied by an involucre and some of them perfectly naked.

The constancy or inconstancy of the mode of attachment of the capsules and of the presence of the involucre may thus be exhibited :

	In the tribe.	In the genus.	In the species.	In the individual.
Mode of attachment of Capsules.	const.	const.	const.	const.
Presence of Involucre.	iuconst.	inconst.	inconst.	inconst.

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Robert Brown was the first to perceive how essentially the fructification of the common Brakes differed from that of other ferns with which it was associated under the name of *Pteris*. Sir J. E. Smith dwelt on this discrepancy, but appears not to have considered it generic ; and it seems to have escaped the notice of almost every other botanist. John Smith—a name I am ever ready to honour—gives the weight of his authority against separating *aquilina* from the genuine *Pterides* : he remarks in the ‘*Journal of Botany*’ (vol. iv. p. 165), “some observers have stated that the sori of *Pteris aquilina* are furnished with a narrow indusium situated on the inner side of the receptacle, but from my own observation I cannot consider the slightly elevated fimbriate ridge which bounds the inner side of the sporangia as being analogous to an indusium.” In my attempt therefore to separate generically, *Pteris aquilina* from the genuine *Pterides*, I fear I shall meet with slender encouragement. It should, however, be observed that the genus *Pteris* has long been disintegrated : several marked forms having been separated under the names of *Allosorus*, *Platyloma*, *Doryopteris*, *Litobrochia* and *Cassebeera* : while a group, more strikingly heterogeneous since the abduction of these divisions, still retains the original appellation of *Pteris*. In accordance with established usage the name of *Pteris* should remain with the first or typical species, and such others as may be supposed to possess the greatest number of distinctive characters in common with that typical species : while *aquilina*, the thirteenth on the Linnean list, and perhaps more decidedly remote than either of the others, seems to require a new name. I therefore propose calling it *Eupteris aquilina*, since, although it is not the Linnean type, it is essentially *the Pteris* of all botanists.

Genus EUPTERIS.

Roots fibrous.

Rhizoma subterranean, horizontal, rapidly extending.

*Fron*d single, rising perpendicularly from the rhizoma at longer or shorter intervals: its *stipes* erect; its *vernation* bent, *not* circinate; its texture subcoriaceous; its *division* compound; its *ultimate divisions* sessile, with distinct midvein and many dichotomously branched lateral veins, all of which are united to a marginal vein.

Fructification. The marginal vein of the ultimate divisions serves as a receptacle for the capsules, these being attached almost throughout its length in a continuous linear series, which is covered by the bleached fimbriate superior epidermis: *involucre* linear, its *free* margin fimbriate, its *fixed* margin attached to the marginal vein beneath the capsules.

Many years have elapsed since I ventured to express an opinion that genera were for the most part human inventions, designed to accommodate or promote the views of their author, and by no means positive indications of natural grouping. Up to the present time I have seen no reason to alter or modify the opinion then expressed: still, when the work of subdivision has been commenced, when a striking species has been abstracted here and there from a large group, and a number of "common and less interesting forms"* allowed to remain under the original generic title, then the constitution of the genus becomes wholly changed, and its author could not recognise his own handywork in the impoverished group as subsequently restricted. This is the case with *Pteris*, and here I should observe, that in venturing on my present task, it is not the *Pteris* of Linneus of which I treat, but that fractional part thereof—the *Pteris* of John Smith, or the *Allosori aquilini* of Presl.

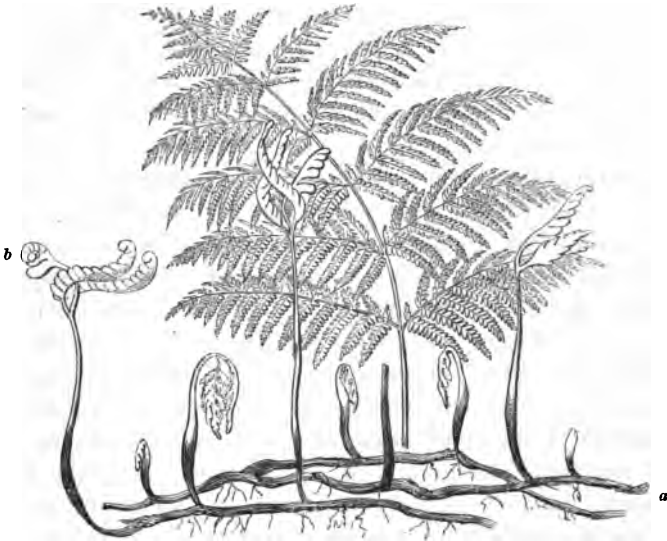
I will now endeavour to explain somewhat more at large the peculiarities of the new genus which I propose to establish.

The rhizoma, fig. 1, *a*, is entirely subterranean, nearly cylindrical, and usually about the size of a goose-quill; it is remarkably succulent, and is clothed with a dark brown velvety coating: it extends very rapidly in a horizontal direction.

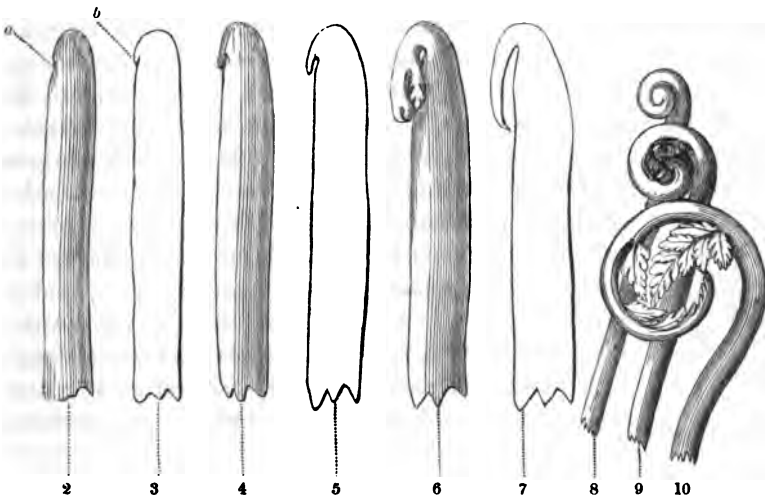
The fronds rise perpendicularly from the rhizoma at unequal intervals: until they nearly reach the surface of the ground the stipes only is discernible, the apex being rounded and displaying no trace what-

* I quote the fashionable botanical phraseology.

ever of a foliaceous portion, (fig. 2): a slight and scarcely perceptible indentation does, however, exist at the point *a* in fig. 2, and the slight projection above this, shown better at *b* in the sectional view fig. 3,



Eupteris aquilina. Fig. 1.



Vernation of *Eupteris aquilina* and *Pteris tremula*.

contains the future foliaceous portion. Figures 4 and 6 represent the same frond in a state somewhat more advanced, and figs. 5 and 7 are

median longitudinal sectional views of the same. In all these it will be seen, that the foliaceous part is bent forward on the stipes, forming therewith a kind of hook; a structure strikingly different from that of *Pteris tremula*, represented at figs. 8, 9, 10, which, although generally held to be closely allied to *aquilina*, very clearly exhibits the usual circinate vernation. It may, however, be observed, that the extreme point of the bent rhizoma has a slight tendency to exhibit a curve, as shown in fig. 7, and all the partial rachides are more or less circinate, as shown at *b* in fig. 1. There is something very anomalous in the rapid development of the foliaceous portion of the frond: at a stage, as regards the stipes, when the circinate frond of *multiflora* exhibits, if unrolled, all its pinnæ and pinnules, and even clusters of capsules, that of *aquilina* is a mere indication, a slight inequality on the surface, and its component parts cannot be detected under a lens of high power: yet in a few days we find it has increased and unfolded with such marvellous rapidity, that in *aquilina* we have a frond surpassing that of nearly every other British fern in magnitude.

The texture of the frond,* when the plant has grown in its naturally exposed situation, is tough and somewhat leathery: in the autumn it assumes a brown hue, and becomes still more rigid and coriaceous. When growing in shade, as in woods, this texture is not so observable.

The lobes or ultimate divisions of the frond have a median vein, *a*, fig. 11, and many branched lateral veins, all of which run to the extreme margin and there unite with a marginal vein, *b b*. The margin is convolute, and its elasticity is so invincible that it is extremely difficult to maintain a lobe in a sufficiently flat position to exhibit, as in the accompanying diagram, the formula of venation. Attached to the marginal vein and extending throughout its length, is a bleached semi-hyaline membrane fringed with a series of jointed capillary segments.† Beneath this membrane are the capsules, also attached to the marginal vein, and arranged along it in a continuous linear series. Again, beneath this linear series of capsules is a second bleached and fringed membrane very similar to the first." This inner membrane I regard as the true involucre.



Venation, Fig. 11.

* These observations have reference exclusively to *Eupteris aquilina*; they will perhaps require modifying, since a North American species, which appears to be uniformly less rigid than *aquilina*, must unquestionably be included in the same genus.

† I here quote a previously published description of *Pteris aquilina*.

In the annexed figure, which represents a small portion of the two membranes highly magnified, the marginal vein of the lobe is supposed to be presented to view edgewise at *e*, the capsules having been removed in order to leave the view of the membranes unobstructed; *f* represents the superior membrane or bleached free edge of the superior epidermis, and *g* the inferior membrane or supposed involucre.

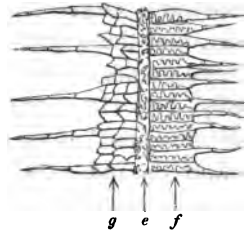


Fig. 12, Fimbriate membranes

Type of the Genus, EUPTERIS AQUILINA. *Allosorus aquilinus, Presl.*
Pteris aquilina of all other authors.

EDWARD NEWMAN.

9, Devonshire Street, City,
July 24, 1845.

(To be continued).

Remarks on Structural Botany. By WILLIAM WILSON, Esq.

(Continued from page 229).

IN the published part of the present paper (see *Phytol.* ii. p. 229), instead of defining *Raphe* as an "*adherent funiculus*," it would be better to substitute the following:—"a funiculus adhering laterally throughout its whole length to the ovule."

It follows from this view of the subject, that the term *chalaza* is wholly unnecessary, and should therefore be discarded.

In connexion with this topic it may be proper to obviate some confusion which has crept into the definition of an ovule &c.

In Lindley's Introduction, p. 179, the ovule is said to be "inclosed in two sacs or integuments:" it is much more correct to say that it *consists* of two sacs inclosing a nucleus. (See Lindley's Key, No. 398, p. 30).

In Lindley's Introduction (p. 218), the term *orthotropal* is used to express a certain position of the embryo, which is at variance with the definition at p. 417, where *orthotropal* is described as "straight, and having the same direction as the body to which it belongs;" whereas it is intended, in the case of an embryo, to indicate that its radicle is the lowest point; that is, where the *ovule* is anatropous with its foramen downwards, the embryo will be *orthotropal*, with its cotyledons directed upwards. It seems advisable therefore to discard this and the cognate words in reference to an embryo, *per se*; as they

confound rather than illustrate. As a general rule, it is sufficient to say, that the direction of the embryo is such, that the foramen of the ovule points out the future position of the radicle. (See Lindley's Key, No. 412, p. 31). The radicle, however, is not "*always* next the foramen" as there stated. An exception occurs in *Lemna gibba*, where the indurated foramen of the secundine or mesosperm is carried up in germination on the tip of the cotyledon, to whose lower lip it is firmly attached like a little circular shield, and the radicle remains within the testa, which bears the same relation to it as the sheath does to the root of the full-grown plant. Here, then, we have an instance of an anatropous ovule containing an "anatropal" embryo; though inasmuch as that embryo has the same direction as the body of the seed, it ought rather to be called orthotropal. In *Lemna minor* the embryo is "heterotropal" because the ovule is in a position intermediate between orthotropous and anatropous, viz. — the base and foramen directed horizontally across the ovary.

WILLIAM WILSON.

Note on Cinclidotus riparius, var. β. terrestris. By WILLIAM WILSON, Esq.

THIS is the moss found near Bristol by Mr. Thwaites, to which I at first applied the name *Barbula cylindrica*, Wls. MSS.

Some doubts still exist about the propriety of referring it as a variety to *Cinclidotus riparius*, because the aquatic state, though diligently sought for in the stream of the river Frome, has not yet been found.

WILLIAM WILSON.

Orford Mount, Warrington,
17th July, 1845.

On the claims of Alyssum calycinum to a place in the British Flora.
By the REV. GERARD EDWARDS SMITH, M.A.

ALLOW me the space to make a few remarks on the claims of *Alyssum calycinum* to a place in the native Flora of this island.

The distribution of this plant in this country is extensive. Your friends and the records of English Botany have traced the species from Arbroath and Edinburgh through Yorkshire into Leicestershire, and southwards into Essex. It is remarkable that all these localities

approach or touch the eastern coast, and, in a descending line through the island, lie in the general longitude of Belgium, Germany and France, countries considered the *native habitat* of the plant in question. There is no circumstance of which I am aware, connected with the *distribution* of *Alyssum calycinum*, which invalidates its claim to a place in our indigenous Flora.

The objections raised against its claims rely principally on two grounds. 1. That it has not been noticed as a British plant *until recently*. 2. That it occurs in *England* only upon *ploughed land*.

The first objection is of no more weight than doubts as to the indigenous character of *Bunium Bulbocastanum*, *Ophrys arachnites*, *Orobanche caryophyllaceæ*, or *Neottia æstivalis* would be.

“ Full many a flower is doomed to blush unseen,”

and that is not the flower's fault. 2. It appears that *Alyssum calycinum* has been gathered only on *ploughed* land in England: whereas in Scotland it is collected upon grassy commons near the sea-coast. But in the continental range of the species, dry fields and sandy waysides, and walls are mentioned as its *favourite habitats*. These are scarcely more uncultivated localities than arable land. Besides this, many of our common plants equally affect ploughed and virgin soil, as *Plantago lanceolata*, *Leontodon Taraxacum*, *Trifolium procumbens* and *filiforme*, &c., &c. It is a new objection to the indigenous origin of an annual or biennial that it occurs only on ploughed land, in a certain locality. If this be a good rule in favour of the *naturalization* of a species, how many of our commonest plants, such as the three above mentioned, must be rejected from all claim to a place in our native Flora? If the plate in the ‘Supplement to English Botany’ is the likeness of average Scotch specimens, the stature of the Scotch plant is short indeed compared with other specimens, and all which I have observed in the fallows of this parish.

It is worthy remark, that in Cantley the *Alyssum calycinum* has been noticed only upon land which has been untouched by the plough eighteen months, or at least twelve. The plants in May had a woody branched decumbent base, stripped of leaves, from which the shoots which produced the spring flowers rose upward erect. These branches had not certainly grown up *since* the winter. The plant is, I suspect, a *biennial*; and if so, its presence, as to ploughed land or *fallows* only is accounted for, as well as its rare occurrence: the young plants being mostly ploughed in at Michaelmas or Lent.

I have detected it, however, upon every fallow, with a *sandy loam*

soil having an excess of sand, which I have had time to examine carefully: most abundantly in a field nearest and north of Besecar Grange farm; but in a similar soil on Wilby, Besecar, and the Glebe farms, it associates with *Veronica triphyllos*, which is frequent and plentiful on the sandy loam of this parish: not so abundant, however, as the elegant *Agrostis Spica-venti*, which is indeed universal.

I do not understand the observation in Mr. Babington's excellent 'Manual,' "Shorter filaments with two setaceous *appendages* at the base." These processes are attached to the base of the flower, and remain so, after the stamens have been removed. They have the appearance of abortive filaments, and might perhaps distinguish the yellow-flowered species of *Alyssum* from the white. These appendages are represented, imperfectly, in the figure in 'Supplement to English Botany,' t. 2853.

The following is a list of the localities of *Alyssum calycinum* which I have noticed in your pages, and in the communications of friends.

Scotland. Arbroath, Dirlton Links, near Edinburgh.

England. Yorkshire: Heslington Fields: Poppleton and Acomb, near York, (Phytol. vol. i. 843): Castle Howard: Cantley.

Leicestershire, Babington's 'Manual.' *Essex,* Saffron Walden: Mr. Gibson, in Phytol. *Epping*, (Phytol. vol. ii. 220., &c.)

Desiring the attention of your readers to these general notes, I remain, &c.,

G. E. SMITH.

Cantley, July 24, 1846.

Notes on the Cowslip and Primrose. By W. MARSHALL, ESQ.

WILL you allow one who takes a great interest in everything relating to Phytology, to contribute a fact which bears somewhat on the specific identity of the cowslip and primrose? Some few years ago, when all, and more than all my leisure time was devoted to botanical pursuits, having heard of the results of Professor Henslow's experiments on this subject, and being desirous of testing their accuracy, by an independent observation, I procured a wild cowslip from an adjoining pasture, very early in the season, and planted it in my garden in rich soil, in which, at the time, I had neither polyanthus, primrose, nor oxlip.

The plant grew vigorously, and at the proper season I collected the seeds and sowed them broad-cast on a small plot of ground. When they had attained a convenient size, I planted out about sixty of the

seedlings, four inches apart every way. They grew vigorously, and I believe *all*, but certainly nearly all, flowered the following season, and with what result think you? Why, every individual of them was a mere cowslip, in all respects like its parent, not one of the sixty individuals having sported either in form or colour.

After this decided result the plants were neglected and trodden upon, but some flowered again the second year without any change.

Would not this experiment, which can be attested by others as well as myself, lead to the conclusion, that there must have been a "hitch" somewhere in the recorded experiments of Professor Henslow and Mr. Watson? I do not pretend to suggest where.

A year or two after the above experiment, I sowed in like manner, a few seeds of the oxlip, with a similar result.

W. MARSHALL.

Ely, August 5, 1845.

Proceedings of Societies.

BOTANICAL SOCIETY OF EDINBURGH.

Thursday, May 8th, 1845.—Dr. Seller, V. P., in the chair.

A collection of British specimens was announced from the London Botanical Society; and fresh specimens of a *Primula*, regarded as the *P. elatior* of Jacquin, from Dr. Dewar, Dunfermline, were placed on the table.

The following papers were read—

1. 'On some species of *Cuscuta*.' By Charles C. Babington, M.A., F.L.S., &c., Cambridge.
2. 'On the genus *Diodium*, *Breb.*' By John Ralfs, M.R.C.S., &c., Penzance.

Thursday, June 12th, 1845.—Dr. Douglas MacLagan, President, in the chair.

The Secretary read a letter from Professor Graham, pointing out an error in the minutes relative to the donation of South American plants presented at the April meeting, (*Phytol.* ii. 191), and moved that the notice of said donation should be corrected as follows:—"A communication was read from Professor Graham, intimating a donation by Captain P. King, R.N., of South American plants collected during the voyages of H.M.S. *Beagle*, and which he had directed Mr. Brown, of London, to present, in his name, to the University Herbarium. The

special thanks of the Society (whose office-bearers, together with the Professor of Botany, are the regularly appointed custodiers of the University Herbarium) were voted to Captain King for this valuable donation of plants, and also to Mr. Brown for his care of them, and the trouble he had taken in their transmission," and that a copy be sent to each of the gentlemen named, and to the 'Phytologist.'

The following communications were read :—

1. List of the rarer Lichens found in the neighbourhood of Oswestry and Ludlow, with occasional observations, by the Rev. T. Salwey. This list will shortly appear in the 'Annals and Magazine of Natural History.'

2. Dr. Seller read part of a paper entitled "Observations on some Plants obtained from the shores of Davis' Straits." With these plants Dr. Seller was presented by Mr. Sutherland, a student of medicine, who, last summer, had been a medical officer in a whaler. There are about twenty-five species in all, and some of them are of considerable interest to the botanist. Among them are *Cochlearias*, a *Draba*, a *Lychnis* and some other *Caryophyllaceæ*, *Potentillas*, *Epilobiums*, *Saxifrages*, an *Arnica*, a *Ledum*, a *Pyrola*, a *Pedicularis*, a *Statice*, a *Polygonum*, *Empetrum*, some *Salices* and *Eriophorums*. All of them were gathered within or close upon the Arctic circle on the shores of Davis' Straits, adjacent to the usual course of whale-fishing vessels, and such collections might often be obtained by holding out a slight inducement to some of the many young men who go out annually in the same capacity with Mr. Sutherland.

The advantage of encouraging such collections in arctic latitudes, would be an improved knowledge of the nature of the variations to which certain species are liable under different circumstances of soil, situation and climate. Without such a knowledge, the definitions of these species are likely to continue local instead of universal, that is, applicable to certain localities only, and such as render it difficult and often impossible to recognise them in new situations without other assistance, while the want of the same knowledge is a fruitful source of the unnecessary multiplication of species. Sir William Hooker had some excellent observations on the extreme variations which some species, known in the temperate parts of Europe, undergo in the arctic regions, and Wahlenberg had spoken strongly of the errors introduced when the study of a species is confined to one locality or latitude. Some of the plants in this small collection afforded a striking illustration of the justness of their sentiments.

These variations must take place in obedience to fixed general laws.

If these laws were discoverable, it must be by the multiplication of facts, such as were presented in some of the species now exhibited. In the mean time, as the definitions of some species were nearly useless under a change in the natural circumstances of their growth, the only course left was to adopt prolix description when varieties are met with of species known to undergo much alteration. And this Dr. Seller made his apology to the Society for giving some particulars of this kind in regard to a few of the species now before them.

He then proceeded to offer some particular observations on the specimens exhibited of *Cochlearia anglica*, *Cochlearia fenestrata*, *Draba hirta*, and *Epilobium latifolium*, in comparison with the accounts given of these species by different authorities.

His observations of the same kind on some of the other species were deferred till next meeting.

3. 'On *Datura Tatula*, as a specific for relief of asthma,' by Mrs. H. N. Ferguson, of Biel. In this communication (which is an extract from a letter), the *Datura Tatula* is described as most efficacious in relieving asthmatical complaints, while the *D. Stramonium*, the species commonly used, was found quite inert by the writer.

The following directions regarding the preparation of the plant may be deemed useful:—"The proper time for taking up the roots is towards the end of October, when the seed-pods are ripe; the plants should be drawn from the ground, and the roots cut off, with an inch or two of the stalk. They should then be freed from soil, and dried in the shade. When required for use, the root should be torn into small shreds, and put into a clean tobacco-pipe." "The smoke causes no nausea, so that the most delicate lady may use it."

Mr. Thomas M'Nab was elected an Associate of the Society.

July 10th, 1845.—This Society held its last meeting for the session in the Royal Botanic Garden, on the 10th inst,—Dr. Douglas MacLagan, President, in the chair.

The Curator reported that several valuable additions had been made to the Society's collections during the present season, both in the Foreign and British departments, and that the Library had received valuable additions through the liberality of members and correspondents. During the past year the Assistant-curator has been chiefly engaged in adding to and arranging the Society's Herbarium, and he has to acknowledge the valuable assistance rendered by Mr. C. C. Babington of Cambridge, in reducing to order the extensive collection of European plants. A very valuable and instructive series of these has been selected for the Society, the remainder being set aside

for distribution among the members. Much of the Assistant-curator's time has also been employed in the distribution of the Society's duplicates, especially to foreign members. This work is now nearly completed, the parcels being ready for sending off. A large collection of British plants, which have been accumulating for several years, is now being arranged, and specimens for the Society selected, in order to fill up the different sections marked out in Mr. Brand's plan for arranging that part of the Herbarium. A detailed account of the donations to the Herbarium and Library will be published in the annual report.

The following communications were read :—

1. Dr. Sellar read the remainder of his paper, entitled 'Observations on some plants from the shores of Davis' Straits,' begun at the previous meeting. Among the species on which he particularly commented were, *Stellaria scapigera*, *Potentilla nana*, *Saxifraga tricuspidata*, *Saxifraga cernua*, *Saxifraga rivularis*, *Arnica montana*, and *Pedicularis hirsuta*.

The *Stellaria scapigera* appeared to be new to the catalogue of Arctic plants. Under the name, however, of *Stellaria Edwardsii*, he had seen, in the Society's collection, what appeared to be the same plant, brought also from the shores of Davis' Straits. He had referred the *Potentilla*, of which there were several excellent specimens, to *Potentilla nana*, trusting a good deal to the rounded form of the outer sepals of the calyx, which, according to Lehmann, distinguishes this from all the allied species. Of the *Saxifraga tricuspidata*, the specimens were several and well marked, agreeing perfectly with the descriptions of that Arctic species. Of the *Saxifraga cernua* the specimens were also rather numerous. As usual, most of these had no flowers; but in lieu of them little bulbils in the axils of the upper leaves. What is unusual, of the flowered stems one had three flowers, another two. In all these specimens amylaceous scales covered the roots, giving them at first sight no slight resemblance to *Saxifraga granulata*. The specimens of *Saxifraga rivularis* might be described as gigantic, being about three inches high; no doubt, however, could be entertained of their belonging to that species, notwithstanding the defect of the pigmy aspect. The plants referred by Dr. S. to *Arnica montana* differed much from the specimens of that species produced in the more temperate parts of Europe, and as this striking difference of aspect had raised some doubt at the previous meeting, he entered at some length on the characters by which it appeared that these specimens belonged to the genus *Arnica*. In the specimens of *Pedicularis hirsuta*

suta, he pointed out the resemblance which the petiole and its leaflets bear to the snout of the saw-fish, the peculiar character of this species.

Dr. Sellar having intimated his intention of presenting to the Society's Herbarium the specimens which had been the subject of this paper, amounting in all to about 25 species, the thanks of the meeting were unanimously voted to him for his liberality and for the trouble he had taken in determining the species.

2. On two species of Desmidiæ, by Mr. J. Ralfs, Penzance.

Mr. James M'Nab exhibited a *Pelargonium* belonging to Mrs. Captain Sinclair, Inverleith Row, bearing two distinct varieties of flowers. The flowers, which were strikingly dissimilar, were growing on separate branches, no artificial means having been employed in their production.

Dr. Neill sent a specimen of the Tussac grass, received from the Falkland Islands. Thanks were voted to Mrs. Captain Sinclair and Dr. Neill.—*W. W. E.*

BOTANICAL SOCIETY OF LONDON.

August 1st, 1845.—John Reynolds, Esq., Treasurer, in the chair.

Mr. F. Barham exhibited specimens of *Oenanthe fistulosa* (L.), collected by him in Battersea Fields, Surrey. They were growing in water, on a very moist spot, and on pasture of the usual character. Mr. B. observed the roots of the plants in water to be of a fibrous nature, in the moist soil somewhat stoloniferous, and in some more dry situations, tuberous, of the fusiform character. One plant that grew on the spongy soil at the edge of the water, and had fibrous roots, possessed also large decaying tubers of last year, the result, Mr. B. imagined, of the very dry summer.

Read, "Remarks on the Botany of that section of Staffordshire included by the rivers Trent and Dove, from their junction, to eight miles up the course of each," by Dr. Spencer Thomson.—*G. E. D.*

Notice of the Discovery and description of Carex montana, (L.)

By WILLIAM MITTEN, Esq.

IN the early part of May, 1843, I had the good fortune to gather a specimen of this plant in a field, by the road-side towards Eridge in

Sussex, about a mile south of Tunbridge Wells; and not being able to reduce it to any described British species, I labelled it *Carex montana*, from the short description in Reichenbach's 'Excursoria,' reserving it for comparison with specimens of that plant. A short time since, having occasion to show Mr. Borrer Sussex specimens of *Carex axillaris*, I fortunately showed him my *C. montana*, and he most obligingly sent me his specimens from Hoppe, which, with the figure in Schkuhr, exactly corresponded with my plant. In company with Mr. Borrer I visited the locality in July last, and found the plant in considerable quantity, but so very far past maturity, that we had great difficulty in obtaining specimens with entire spikelets. Mr. Babington has kindly favoured me with the description of this species, drawn up for his Manual, and which is as follows:—" *Carex montana*, L. Fertile spikes 1—3, ovate, near together, sessile; bracts small, membranous, the lowest with an awl-shaped point; glumes obtuse or retuse mucronate; fr. narrowed below, oblong-obovate, trigonous, with a short notched beak; nut oblong, narrowed below, with a pyramidal beak; root fibrous. Schk., F. 29. H. b. 21. Stem about a span long, slender. L. narrow, glumes very dark, midrib narrowly yellowish, fr. hairy, its beak purple.—P. V. VI."

To the above excellent description I can only remark, that the root is remarkably stout and woody, and bears a large tuft of long and narrow leaves, the sheathing bases of which are deeply stained with purple, and connected in the same manner with netted filaments, as those of *Carex palulosa*.

Carex montana is cited in Sir J. W. Hooker's 'British Flora,' under *C. pilulifera*, which may be accounted for by the specimens in the Linnean herbarium being by accident *C. pilulifera*. Reichenbach says, under *C. pilulifera* (Excurs. 438), "*C. montana*, Linn. herbar." The Linnean *C. montana* is found "in campis Upsaliæ," and we learn from Wahlenberg's 'Fl. Upsal.' that our plant is found near that city.

WILLIAM MITTEN.

Hurstperpoint, August 19th, 1845.

Note on Cystopteris alpina, Desv., the Low Layton plant. By
FREDERIC BARHAM, Esq.

It being reported that this plant was still in existence (notwithstanding Sir W. Hooker mentions the destruction of its habitat) I resolved to go, and if possible search closely the spot, and also its immediate neighbourhood. After examining the exterior walls and buildings, I sent in my card, stating the purport of my visit. The

lady of the house told me she understood it was destroyed when the walls were repaired some years since, but kindly requested that I should examine for myself, and that should I find it, she would have it preserved. I searched all the walls around the grounds, &c., saw the gardener, who showed me the spot where it grew, and told me it had been dead some years. By making this known you may save botanists a fruitless search, and the polite proprietor of the house will be relieved from many inquiries. Just previous to my visit, among several inquirers was an eminent Professor of Botany.

FREDERIC BARHAM.

10, Osnaburgh Street, Regent's Park, August 9th, 1845.

Account of a Botanical Excursion to the Mull of Cantyre and the Island of Islay, in August, 1844. By J. H. BALFOUR, M.D.

A party, consisting of Mr. Babington, author of the 'Manual of British Botany,' Dr. Parnell, author of the work on British Grasses, Mr. John Miller, Jun., Mr. John Alexander, Mr. R. Holden, Mr. Risk, Mr. Craig and myself, left Glasgow by the St. Kiavan steam-boat at 11, A. M., on Saturday, the 10th of August, 1844. There was a large party on board returning from the Highland Society's cattle-show. The day was remarkably fine, and we had an excellent view of the beautiful scenery on the shores of the Frith of Clyde. This in some measure compensated for the slow progress of our boat, which did not reach Campbelton till near 9, P. M. Campbelton is prettily situated in an inlet of the sea, the opening of the bay being protected by an island, which, however, becomes a peninsula at low water. The island is composed of a porphyritic rock, which is sometimes used for making ornaments of various kinds. The climate is mild, and many of the more delicate plants stand the winter well. On visiting one of the gardens in the vicinity, under the guidance of Mr. Stewart, chamberlain to His Grace the Duke of Argyll, we found myrtles, hydrangeas and other tender plants thriving in the open air, and we observed a fine Fuchsia hedge which was in full flower, and contributed in no small degree to ornament the garden.

On the 12th of August we left Campbelton early, and proceeded by the shore towards Kildalloig, and thence by the rocky and sandy shores of the Mull as far as Ballishear. The cliffs are not so precipitous as those on the Galloway coast, and did not produce many rare plants. The most interesting plants were found on the shore. Some of the party who went inland, were by no means successful in their botanizing, but this may probably be attributed in some measure to

their having spent a portion of their time with Mr. Stewart, enjoying the pleasures of grouse-shooting. The result of their sport was found to be by no means unacceptable at the end of the day's work.

Among the plants met with, I may notice *Epilobium angustifolium*, which grew in great profusion and beauty, *Hypericum Androsæmum*, a common plant in all our western counties, *Hieracium umbellatum*, *Convolvulus Soldanella* and *sepium*, *Atriplex laciniata*, *rosea* and *angustifolia*, *Sinapis monensis*, *Helosciadium nodiflorum*, both in a large erect, and in a small creeping form, *Cotyledon Umbilicus*, *Vicia sylvatica*, *Lolium temulentum* and *Epilobium virgatum*, distinguished from *Epilobium tetragonum* by its leaves being truly decurrent, the scions from the lower part of the stem being very slender and filiform. It is a species of Fries, but it does not appear to me to be well marked. In salt-marshes we picked *Scirpus maritimus*, *Blysmus rufus*, *Ænanthe Lachenalii*, a common plant in the west of Scotland and usually mistaken for *Æ. pimpinelloides*, from which it is distinguished by its elongated, slender, fusiform and subcylindrical tubers, gradually enlarging from the base of the stem, and having no distinct pedicle, as well as by its fruit being broader than the calyx and contracted at the base.* Dr. M'Donald mentioned his having found *Linnæa borealis* near Kildalloig.

At Southend the shore and the inland party met, and the latter were so satisfied with their day's sport and with the comfort of Mr. Mackay's inn, as well as with the prospect of a good dinner, that they declined proceeding further for the night. The movement party was thus reduced to three, who visited the sandy shores in the neighbourhood and walked on to the lighthouse at the Mull. On the sands at Southend, *Convolvulus Soldanella*, *Raphanus maritimus*, *Sinapis monensis*, *Sagina maritima* and *Reseda Luteola* were found in profusion. The old church at Keill and the ruins of the castle of Dunlaverder attracted attention. Near an old church-yard on the road-side, *Hyoscyamus niger* was met with, and near Carskay, *Geranium pratense* was picked. The rocks in the vicinity have been hollowed out into caves, some of them of great size and depth. Similar caves had been noticed in the rocks along the shore from Campbellton to Southend, and one of them is designated the cave of St. Kiavan, from some legend connected with that saint.

August 14th.—Having procured a cart for our baggage, the most

* For an account of the British species of *Ænanthe*, see paper by Mr. H C. Watson, in the 'Phytologist,' vol. ii. p. 11.

bulky portion of which consisted of paper and boards, we crossed the peninsula of Kintyre or Cantyre, towards Machrihanish bay, passing the old church of Kilchingie. The shores at the bay are composed of immense hills of sand raised by the waves of the ocean, which roll on the beach at times with enormous fury, causing their roar to be heard for many miles. The sands are kept together and prevented from being blown inland by *Ammophila arenaria*, *Carex arenaria*, *Triticum junceum*, and other plants commonly known as bent or marram, the stems and roots of which, extending in all directions and interlacing together, form a sort of basket-work, and this gives a certain degree of firmness to the loose soil.* Plants thus contribute in some measure to the solidity of the land and prevent the inroads of the ocean. In Norfolk there are low hills of blown sand 50 or 60 feet high, bound together by means of grasses and sedges in the way I have mentioned. The maritime part of Lincolnshire which lies below the sea-level is protected in a similar manner from the invasion of the sea; and the great embankment in Holland owes its stability, in no small degree, to the plants which grow on it. The drifting of sands often causes great devastation, covering thousands of acres of land, and destroying vegetation. This is seen in many parts of this county, as well as in France, Holland and Russia. About the commencement of last century the French government took up the subject, and directed attention to the shifting sands in that part of France which lies near the Bay of Biscay. A species of fir, *Pinus maritimus*, *major*, was planted, which now covers the sandy desert, and has effectually checked the progress of the sand drift. Some interesting facts on this subject were lately given in the 'Gardener's Chronicle,' where it is also stated, that on the estate of Lord Palmerston, on the west coast of Ireland, between the towns of Ballyshannon and Sligo, nearly 1000 acres of land were covered with sand, in some cases to the depth of 100 feet or more. About eighteen years ago, the *Ammophila arenaria* or bent was planted in these sands in large quantity, and the *Pinus maritimus major*, from Bourdeaux, and other pines, were also introduced, and by this means a most striking improvement has taken place. About 800 imperial acres have been reclaimed and converted into productive pasture land.

On reaching the lighthouse we were most hospitably entertained by

* Besides the plants mentioned, *Elymus arenarius*, *Triticum repens*, *Festuca rubra* and *arenaria*, *Galium verum* and *Trifolium repens* are commonly found assisting in fixing the sand.

Mr. Noble and Mr. King, the superintendents, and everything was done to promote our comfort. The country around the lighthouse is bare and rocky, and produces no plants of any interest. The Mull is well described by Macculloch as a rude hilly tract, without beauty, even on its sea-shores. The only interest is connected with the caves in the rocks to which I have alluded. In the interior of the district little is to be seen, and it is chiefly on the shores that a botanist or geologist finds materials for research. At the point of the Mull the tides flow with rapidity and turbulence, and it is by no means pleasant for one who is unpractised in a sea-voyage, to beat round the headland in a boat.

On the morning of the 18th we examined the peculiarly rugged and precipitous rocks near the lighthouse, some of them rising to several hundred feet above the level of the sea. *Sedum Rhodiola* was seen in abundance, but no other plants deserving notice. After breakfast we walked along the upper part of the cliffs towards Largybean, where fine caves and stalactites occur. The rocks, composed principally of micaceous slate, were comparatively unproductive, and it was chiefly in those parts where limestone occurred, that our researches were rewarded by plants in any way rare. One of the most interesting plants was *Dryas octopetala*,* associated with *Saxifraga aizoides*, *oppositifolia* and *hypnoides*, *Spergula subulata*, and a hairy variety of *Hieracium sylvaticum*. The day was very wet and misty, and not favourable for botanical pursuits. Nevertheless, we examined the rocks carefully, and reached Sossit, after being joined by the Southend party, about 3, P. M., and were kindly received at Mr. M'Neill's. We visited his garden, and saw a species of passion-flower in full bloom, which stands the winter well, also hydrangeas attaining an enormous size and covered with a profusion of flowers, besides Fuchsias, pelargoniums, *Salvia pratensis*, &c. Passing through the fishing village near Sossit house, we made the best of our way to our old quarters at Campbelton, traversing a flat country, in some parts furnishing coal, which is conveyed by means of a canal to the eastern shore of Cantyre. On either side of the flat heath which extends from Machrihanish bay to Campbelton, there is a hilly, moorish district, which has not yet been brought into cultivation.

Lint (*Linum usitatissimum*) is commonly cultivated in this district of Scotland, and in all the fields we observed abundance of

* This plant is often found on limestone rocks not far from the sea-level, as at Ossynt in Sutherlandshire.

Cuscuta epilinum twining round the stems and destroying the crop. The *Cuscutas* or dodders, of which three species are natives of Britain, are most troublesome weeds, which are not easily extirpated. Their seeds germinate in the soil, and the plants immediately turn themselves round others in their neighbourhood, becoming attached to them parasitically by means of suckers, and ultimately losing their connexion with the soil. They are very destructive to crops, and different species are connected with different plants. A species lately imported into Britain has done much harm to the crops of clover. In the lint fields *Camelina sativa* was also present, probably imported along with the seed.

The party walked along the shore of Machrihanish bay, passing Ballochantry Kirk, Barr House (Mr. M'Alister), Glenacardock Point, Linanmere Kirk, and Killian; and reached Taynlone in the evening. The rocks were chiefly micaceous and calcareous. At some places, as near Barr House, the limestone is quarried, and there are caves which extend to a great depth; we entered one which extended about 150 feet. The road from Machrihanish bay northward, runs along the shore, and enables the traveller to have a fine view of the channel of Gigha, as well as of the islands of Jura and Islay. The Paps of Jura form very conspicuous objects in the distance. In some places near Balloshantry and Killian, where the road winds among broken, detached rocks, the scenery is romantic and interesting. At Killian there is a curious old church in ruins, apparently referrible to the Norman times, with round arches, coupled circular-headed windows, and peculiar doors, made with two side stones converging upwards, and a flat stone on the top, resembling in some degree what is seen in Egyptian architecture. Part of the old church is used as a burying ground by the Mac Donalds of Largy. In the church-yard are many old inscriptions and some curious carvings on stone. The ruins are prettily situated on the banks of a stream. There is a vitrified fort in the neighbourhood. At a little distance from the shore in this quarter, and parallel to it, there runs a ridge of old red sandstone rocks, and the streams coming from the higher grounds when descending over these rocks, give rise to numerous picturesque water-falls. The plants gathered this day were, *Thalictrum minus*, *Convolvulus Soldanella*, *Sinapis monensis*, *Ranunculus sceleratus* and *Scirpus Savii* in moist places, *Crambe maritima*, *Ligusticum Scoticum*, *Hypericum Androsæmum*, *Epilobium angustifolium*, *Vicia sylvatica* in great quantity on the dry, stony beach, *Pulicaria dysenterica*, *Vicia sativa* on sandy shores near Taynlone, *Eryngium maritimum*, *Steenhammera*

maritima, or, as it is usually called in this county, the oyster plant, from the taste of its leaves,* *Apium graveolens* near Taynlone, *Conium maculatum*, especially in church-yards, as at Killian, *Anagallis tenella* in all moist places, *Schoenus nigricans*, *Atriplex erecta* in fields near Barr, *Fumaria capreolata*, *Cerastium atrovirens*, *Pyrethrum maritimum*, and *Catabrosa aquatica* assuming a remarkably stunted and creeping appearance on moist sandy shores near Killian; the fruit of this grass is very sweet, having the taste of liquorice. *Hieracium boreale* was also picked near Linanmore Kirk and Barr, *Tanacetum vulgare* near Killian, *Carex vulpina* near Barr, *Equisetum Telmateia* in many places between Campbelton and Taynlone.

We reached this latter place between 5 and 6 P. M., and took up our quarters in a small inn, where we had considerable difficulty in getting accommodation, some of the party sleeping, or attempting to sleep, on the floor, and others on the tops of tables. In the neighbourhood of the village we saw *Potamogeton pusillus*, *Alisma Plantago*, *Samolus Valerandi*, *Catabrosa aquatica* and the maritime variety already alluded to, *Hippuris vulgaris*, *Bidens cernua*, *Oenanthe Lachenalii*, and *Lolium temulentum*, or the poisonous darnel-grass. This grass seems to be common in many parts of Kintyre. All along the shore, especially near Taynlone, we met with profusion of Algæ, and after storms I have no doubt that many rare species might be gathered.

Aug. 15th.—This day we intended to have crossed by a ferry-boat to the island of Gigha, but the weather was so stormy, and a north-west wind was blowing with such fury, that it was deemed advisable to proceed along the shore to the fort of Loch Tarbet, where the steam-boat touches on its way to Islay. Accordingly we proceeded to Clachan and Stewartfield and thence to Porthullion. The shore is bare and unproductive. *Helosciadium nodiflorum*, *Trollius europæus*, *Lycopus europæus*, *Bidens tripartita* and *Papaver dubium*, were the chief plants which we picked. Near Porthullion we were more successful, having gathered *Radiola millegrana*, *Carum verticillatum*, *Pinguicula lusitanica*, *Salicornia herbacea* (the procumbent variety), *Schoberia maritima*, *Epilobium virgatum*, *Eleocharis pauciflora*, *Myrrhis odorata*, *Veronica scutellata*, *Habenaria viridis* and *Sedum Telephium*. About 4 P. M. we joined the Maid of Islay steamboat, and after encountering a heavy swell off the northern point of Gigha, to the no small discomfort of some of the party, we entered the sound of

* In America, *Tragopogon porrifolius*, or salsafy, receives the same name. Its roots are used for soup, which is said to resemble oyster soup.

Islay and reached Portaskaig about 9 P. M. Here, through the kindness of Mr. G. T. Chieve, factor for Mr. Campbell of Islay, we found a cart ready for our baggage, and a carriage-and-four to convey the party to Bridgend and Ealabus, our drive commencing in true Highland style, with a bagpipe accompaniment. A comfortable inn at Bridgend received some of the party, and the remainder were kindly accommodated in Mr. Chieve's house at Ealabus.

Before considering the Botany of Islay I shall make a few remarks on the general features of Cantyre Botany. The part of Cantyre examined by the party did not yield many rare plants. This may depend in some measure on the nature of the rocks, which are often of a hard, non-disintegrating and dry micaceous nature. The most prevalent rock is mica-slate. This, along with some chlorite-slate, forms the greater part of Cantyre. The old red sandstone formation occurs on the shore between Campbellton and Ballyshare, and is also found on the island of Sunda. It likewise appears on the west coast, and can be traced from Campbellton by Kilchinzie to Machrihanish bay. I have already stated, that it forms a range of cliffs at a short distance from the shore near Killian. Primary limestone occurs to the north of Campbellton and in several places near Killian and Taynlone, as well as in the Largybean district, not far from the point of the Mull. In the valley which extends from Campbellton to Sossit we meet with the carboniferous series of rocks. The island of Gigha is composed of mica-slate.

The crops, so far as we observed, were good, and the harvest was early. On the 13th of August we saw some barley cut. Rye is cultivated in many places. We could not detect any ergot in it. Bear or big (*Hordeum hexastichon*) is also cultivated for the use of the distilleries, which are numerous in this part of the country. Potatoes were excellent in the sandy and peaty soil.

Much might be done to improve the agriculture of the county by proper drainage, the use of the new manures, and the introduction of some good grasses. Arrhenatherum avenaceum or oat-grass is a common weed in Cantyre, and might be advantageously sown on waste lands as a grass of which horses and cows are fond. Timothy grass (*Pleum pratense*) thrives well, and might be sown with benefit as a late grass, while Alopecurus pratensis might be sown as an early one. These two last-named grasses are not common in Cantyre. Holcus lanatus or Yorkshire fag is very common. It is a poor grass, and might be replaced by others of a more nutritious quality. Festuca elatior would do well in boggy places. Avena flavescens was not met

with, but it is well fitted for dry lands. Italian rye-grass might be sown with advantage, as it thrives in a mild climate. We did not see this grass during our walk. *Catabrosa aquatica* is a very nutritious, saccharine grass, which does well in wet land where draining cannot be carried on easily. In Belgium, Dr. Parnell informed me, it is much used for fodder, and the cows there are said to give excellent milk and butter. Near Taynlone this grass occupies a great extent of the sea-shore, and the seeds might easily be collected in large quantity. The poisonous darnel-grass was met with among the crops in several places; although it did not occur in such quantity as to give rise to injurious effects, so far as we could ascertain. It ought, however, to be extirpated, as cases of poisoning have occurred from using it in the preparation of bread.

Besides the part of Cantyre to which I have alluded, on our return from Islay, we also examined part of the shore of Loch Tarbet, near its northern extremity, and the neck of land between west and east Tarbet, which is not much more than a mile broad. Boats are sometimes carried across from one sea to the other; and there is a curious fable mentioned by Pennant, that Donald Bane ceded the western Isles to Magnus, as the condition of his receiving the aid of Norway against the family of Malcolm. By the contract, Magnus was to have all the islands,—the definition of an island being, whatever could be circumnavigated. The Norwegians, it is said, caused his boat to be drawn across the isthmus, between the two lochs Tarbet, and thus included Cantyre in the bargain. This story is considered as a mere fable by Macculloch.

The shores of Loch Tarbet are beautiful and picturesque, and the sail up the Loch in a fine day is very interesting. The country around has an undulated surface, with here and there some fine woods coming down to the water's edge, and surrounding cultivated spots of various extent. We made a few additions to the Flora of Cantyre, on the shores of the Loch, by picking *Milium effusum*, *Circæa intermedia*, and large specimens of *Salix pentandra*.

I now proceed to give an account of our excursion to the island of Islay, and in doing so, I shall allude only to the more interesting phanerogamous plants and ferns, inasmuch as the mosses, lichens and seaweeds observed by the party, possessed no attractions as regards rarity.

Islay is one of the western islands of Scotland, and was at one time famous as the residence of MacDonald, one of the great kings of the isles. The holds or castles of the MacDonalds exist on islands in some of the fresh-water lakes, to which I shall afterwards allude, especially Loch Gurim and Loch Finlaggan. The extreme length of the island from the Moile of Oe in the south, to Rumbail in the north, is about 30 miles, and its breadth from the point of Ardmore on the east to Sanig in the west, is upwards of 20 miles. The superficial extent is about 154,000 acres, and the extent of coast is nearly 200 miles. The form of the island is irregular, and it is deeply indented by an arm of the sea, called Lochindal. It is chiefly composed of those hypogean rocks, termed by Lyell metamorphic, or altered rocks, in consequence of the supposed changes which have taken place in them since their deposition. These metamorphic rocks contain few or no organic remains, and are thus separated from the palæozoic stratified rocks. Clay-slate is looked upon as intermediate between the metamorphic and the fossiliferous strata. The transition, primary, fossiliferous and grauwacke of authors, are considered as belonging to the palæozoic series, being the strata which contain the fossil remains of the earliest formed animals. The principal part of the island of Islay consists of quartz rock, with beds of clay-slate, grauwacke-slate and micaceous schist. Quartz forms the high grounds of the north, and the great mass of the Oe district. Gneiss occurs in some parts of the island and limestone in others. Porphyritic and basaltic rocks and veins are met with in many places; the basalt being often of an amygdaloidal nature. Near Portaskaig a peculiar kind of conglomerate occurs. Lead and iron are found in the island, the former being mixed with copper and some silver. At Ballegrant the lead is worked, and the veins are tolerably productive. In the Rhins a vein of magnetic iron ore occurs, which, according to Mr. Campbell, contains a small percentage of titanium. A rich ore of iron is found on Sossit hill, and a vein of iron glance at Ballyneal. At Stramishmore, in the Oe, there is a vein of impure graphite, 200 or 300 feet wide. Mr. Campbell states that he has analysed this, and finds that the quantity of carbon varies from 9 to 60 per cent, and iron from 5 to 16 per cent. He also has detected manganese in small quantity. Dr. R. D. Thomson has examined two specimens of this impure graphite, and the following are the results he has obtained:—

Peroxide of iron	—	—	20.79	20.00
Sesquioxide of manganese	—	—	7.33	2.44
Magnesia and some lime,	—	—	trace	12.00
Plumbago	—	—	13.67	3.60
Carbonate of lime	—	—	20.12	1.15
Insoluble matter, consisting of silica and alumina, &c.	}		32.76	55.00
Water	—	—	5.33	6.81
			<hr/>	<hr/>
			100.00	101.00

Near Ealabus there is a chalybeate well. Throughout the island monumental stones, forts, and other antiquities occur. The climate is similar to that of the other western islands, being mild and moist. Plants which will not bear the rigour of a continental climate succeed well. At Islay House many of the more delicate plants thrive in the open air. The garden contains several plants which are interesting both in a floricultural and horticultural point of view. At Mr. Campbell's cottage, in the south-east of the island, many fine plants were observed. Rhododendrons there attained a very large size.

In Islay there is still a great extent of improvable land which might easily be brought into cultivation. Much has already been done in the way of improvement by the spirited and enlightened proprietor, Mr. Campbell, and he has been ably seconded in his efforts by Mr. Chieve, his intelligent, indefatigable, and I may justly add, hospitable factor. By draining, burning, paring, and the application of lime, much moorish land has been rendered productive. We saw excellent crops of oats on land recently reclaimed. Mr. Campbell seems to be anxious to introduce all the improvements which have been suggested of late by agricultural chemists, and I believe that his well-directed efforts will soon make a great change in the aspect of the island. The zeal and energy of his factor, too, are seen in the mode in which various improvements have been carried out in the neighbourhood of Islay House, and perhaps in none more than in the formation of a road through a wet peat-moss, which is now in the course of being drained and brought under the action of the plough.

We commenced our excursion in Islay, on Friday, the 16th of August, by starting after breakfast for Kilchoman, which is situated in the south-west of the island. We reached this place by the aid of conveyances provided by Mr. Chieve, and at once proceeded to examine the sandy shores in the neighbourhood. The sands here, as in Cantyre, are kept together by *Ammophila arenaria*, *Carex arenaria*, *Triticum junceum* and other creeping grasses and sedges. Near Kil-

choman we found *Sinapis alba*, *Listera ovata*, *Habenaria viridis* and *Gentiana Amarella*, both blue and white. In the church-yard of Kilchoman there are some curious grave-stones, and an old cross similar to one in the main street of Campbelton. It is said, indeed, that the latter was originally taken from Islay. At Kilchoman our party separated into two divisions, one proceeding along the shore, and the other going inland to examine the marshy ground in the vicinity of Loch Gurim or Gurm. The shore party was, upon the whole, most successful, having picked *Mentha rubra*, *Gentiana Amarella*, *Convolvulus Soldanella*, *Malva sylvestris*, *Conium maculatum*, *Epilobium virgatum* already noticed in the Cantyre trip, and *Equisetum Telmateia* of Ehrhart.* The latter plant is the *Equisetum fluviatile* of Smith, Hooker and Babington. The name is derived from *τελματειος*, growing in mud, but we found the plant growing in moist sand. Both fertile and barren stems were gathered, the former being unbranched, and having numerous large, deeply toothed sheaths, while the latter had whorled branches, were nearly smooth, and presented about thirty striæ on the stalk. A remarkable trailing variety of *Juncus lamprocarpus*, with regular rootings at the joints, covered the shores in profusion, along with *Agrostis alba*, var. *maritima* of Babington, with a procumbent rooting stem, a creeping form of *Eleocharis palustris* and the sea-shore variety of *Catabrosa aquatica*, already noticed in Cantyre. This latter variety is *minor* of Babington and *littoralis* of Parnell. It is abundant on the west coast of Scotland, on sandy shores within the influence of the tide. In some places it covers patches of at least half an acre. I have picked it in Bute in considerable quantity. It differs from *Catabrosa aquatica* in its smaller growth, and in the glumes having mostly only one floret. I may here remark, that the tendency to a trailing habit was seen in many of the plants on the shore, especially at the points where rivulets joined the sea, and some of the species on this account presented an aspect very different from that which they assume in their usual localities.

On sandy ground in the vicinity of the shore, numerous other plants were seen, such as *Arabis hirsuta*, *Gymnadenia conopsea*, with its odoriferous, purple blossoms, *Eryngium maritimum* forming spiny tufts of great extent, the beautiful *Anagallis arvensis* and *tenella*, *Pyrethrum maritimum*, *Ligusticum scoticum*, *Viola lutea*, with all its shades of purple and yellow, *Thalictrum minus* in a very dwarf state, *Spergula nodosa*, *Arenaria serpyllifolia* and *marina*, *Pimpinella Saxifraga*, and *Erythræa Centaurium* and *linarifolia*. One of the plants noticed at-

* As first pointed out by Mr. Newman, Phytol. i. 723, fertile stem figured id. 724 barren 721.

tracted our attention particularly, inasmuch as in Scotland it is usually seen only in alpine districts, while here it was flourishing luxuriantly at the sea-level. I allude to the *Draba incana*, or twisted-podded whitlow-grass. No doubt in many instances in the north of Scotland we see alpine plants coming down to the level of the shore, as at Cape Wrath, in Sutherlandshire; but the northern nature of the locality accounts in a great measure for the apparent anomaly. But in the case of Islay, the occurrence of alpine species so low, cannot be accounted for in the same way. Mr. H. C. Watson says that *Draba incana* belongs to the alpine and upland regions of Scotland and England. It is often found on alpine limestone rocks. It is met with near the summits of the mountains in Wales, Westmoreland and Scotland. I have specimens from Raven-scar, Walden, and from Teesdale in Yorkshire. In marshy spots near the shore we observed *Hypericum elodes*, *Sparganium ramosum*, *Oenanthe Lachenalii*, a common plant in the west, and *Samolus Valerandi*; while in fields *Papaver dubium* and *Lamium intermedium* were abundant. The only other plants of interest remarked in this locality were *Radiola millegrana*, *Ononis arvensis*, *Atriplex-laciniata* and *rosea*, *Cerastium atro-vivens*, *Cakile maritima*, *Trifolium arvense* and *Eleocharis pauciflora*.

After a thorough examination of the sandy shore, the party proceeded towards some slaty rocks, where *Sedum Rhodiola* and *Asplenium marinum* were found. Here the two divisions were to have joined, but by some mistake no union was effected, and in our search for each other a still further separation took place. Moreover, the day which had been gloomy, now exhibited a most pluvious tendency, and ere long the rain descended in torrents, so as to damp in some measure the ardour of the party, and in the course of the afternoon, there was seen a solitary botanist wending his way through the marshes and bogs, with his habiliments thoroughly saturated with moisture, and his fingers so benumbed as scarcely to be fit for the effort of pulling a plant, while parties of two or three, ignorant of their exact position, and anxious to get to comfortable quarters as soon as possible, proceeded by various devious paths to the nearest huts for information. All fortunately reached their destination in the course of the evening, their arrivals occurring at various intervals, and their adventures being very much diversified.

The peat-bogs which were visited in the course of the day, lie between Kilchoman and Loch Gurinart. They are very wet, and in many places quite impassable in rainy weather, so that it required considerable dexterity on the part of the traveller to avoid being immersed

up to the shoulders. This is particularly the case with the boggy ground near the western extremity of Loch Gurim. In these localities *Scirpus lacustris*, *Sparganium simplex*, *Ranunculus aquatilis*, *Peplis Portula*, *Schoenus nigricans*, *Drosera rotundifolia*, *anglica* and *longifolia*, *Utricularia minor*, with its elegant vesicles, *Rhynchospora alba*, *Hippuris vulgaris*, *Scirpus Savii* and *setaceus*, and the delicate *Pinguicula lusitanica* were observed. *Triglochin maritimum* was picked, along with *Scirpus lacustris*, about two miles from the shore. A *Salix* resembling *rosmarinifolius* was also gathered. In all, there were 320 phanerogamous species noticed in the course of the day's walk.

The roads in this part of the island were upon the whole good, but they pass in some places over hilly districts. Potatoes seemed to thrive well, and the fields gave excellent crops of oats. Near Islay House there was a good field of wheat. The flax in the district was not infested with *Cuscuta*.

August 17th.—The morning was very showery and unpromising, and in place of visiting Portnahaven as was proposed, we proceeded along the shore to Bowmore, and thence round Laggan Point as far as the mouth of the river 'Laggan, along the banks of which we botanized as far as the bridge. The piscatorial members of the party considered the day peculiarly favourable for enjoying the luxury of a nibble, but their success was not so great as they anticipated, and as usual, this was attributed to some fault on the part of the river and the fish. One of the party expatiated in glowing terms on the mode in which he hooked a salmon, described his excitement on the occasion, and all the emotions which arise in the bosom of one whose fly, for the first time in its existence, has been honoured by the grasp of so noble a visitor. But unfortunately, this splendid animal preferred living in its native river, even with the appendage of a hook and a broken line, to the pleasure of contributing to the repast of a hungry botanical party. Some sea-trout, river-trout and parr were taken, but even Parnell's prepared minnow, or *minnow-persuader*, as it was called, though wielded most dexterously by the Doctor himself, failed to procure a large supply, and we looked in vain for the salmon which he had promised for dinner.

On the shore near Bowmore we met with the usual maritime plants, as *Aster Tripolium*, *Plantago maritima* and *Coronopus*, *Salicornia herbacea* (the erect form), and *Juncus compressus*. Great quantities of *Zostera marina* had been thrown on the shore by the waves, and were used as manure by the farmers along with sea-weeds. This plant has been employed for various purposes; among others it has been

recommended as a stuffing for beds and cushions. At Laggan Point fine cliffs occur, but they are not productive, being chiefly covered with *Pyrethrum maritimum*, *Arenaria maritima*, *Cochlearia officinalis* and some grasses. Beyond this point the shore becomes sandy and is covered with bent. A little way inland boggy ground occurs, in which the three species of *Drosera*, *Rhynchospora alba*, *Utricularia minor*, *Menyanthes trifoliata* and other marshy plants are found. This boggy ground, like that near Kilchoman, was in many places very wet, and resembled, in that respect, the bogs which occur in Ireland, such as those of Cunnemara, in Galway. The peat is of excellent quality, and is used extensively for fuel.

Much might be done to improve this peaty soil by paring, burning, draining and the admixture of sand, which is abundant in the neighbourhood. In cases where draining could not be easily accomplished at once from the nature of the level, the system of colmation, as pursued in Italy, might be practised, so as to deposit soil on the surface of the peat, and thus raise its level so as to enable draining to be afterwards undertaken with success.* The introduction of *Dactylis cæspitosa*, or tussac grass, might be successful in this situation, both from the nature of the climate and the proximity to the sea. Should this grass be introduced into the country, the peaty soil on the western islands of Scotland would probably be that best fitted for its growth. In this way the waste lands of these localities might be made, without preparation, to afford excellent pasture, as well as protection to cattle. This grass was noticed in the Falkland Islands during the recent Antarctic Expedition. A short account of it was published by Sir William Hooker†. The plant is called tussack or tussac grass, from the lower part of its culms forming a tuft or *tussack*. The stems rise to the height of four or six feet, and the leaves hang down all round. It is perennial, and produces large leaves and an enormous quantity of herbage, which is saccharine and nutritious. The cattle in the Falkland Islands are remarkably fond of it. The plant thrives best in a wet peaty soil, in insular situations where the spray of the

* Carte I doanliche della valle de Chiana, con un saggio sulla storia del suo bonificazione et sul metodo con cui vi si Eseguiscono le Colmate, di G. A. Manetti, Firenze, 1823.

The system of colmation was fully explained by Professor Gordon at one of the late conversational meetings, and its application to such localities as Lochan Moss, near Dumfries was pointed out by Mr. Smith.

† Hooker's Notes of the Botany of the Antarctic Expedition. See also, 'Gardener's Chronicle,' for March 4, 1844, and 'London Journal of Botany,' vol. ii. p. 247.

sea dashes over it. Judging from the soil and climate in which it grows, there is every reason to believe that it might be most advantageously sown on the western islands of Scotland. Seeds have been sent home to this country, but only a few of them have germinated. Those sent to the Glasgow garden have not sprouted. Besides the tussac, *Festuca Alopecurus* of D'Urville, or *Arundo Alopecurus* of Gaudichaud also deserves to be noticed as an important Falkland Island grass found in peat-bogs.

The climate of Islay is well adapted for oats, and much of the peaty soil might be rendered highly productive. Wheat also thrives in some places, but this crop probably requires a warmer summer than occurs in the island in general.

On the sandy shores at Laggan we found *Convolvulus Soldanella*, and in the fields *Lamium intermedium* and *Fumaria capreolata*; while the banks of the river furnished luxuriant specimens of *Hieracium umbellatum*, *sylvaticum* and *boreale*. The last mentioned species has been usually regarded as a form of *H. sabaudum*, and is figured as such in English Botany. It is distinguished by its upper leaves being sessile with a round base, not with a cordate clasping base as in *sabaudum*: the involucral scales are appressed in three regular rows, and uniform in colour.

In the woods near Ealabus and Islay House, which we examined at different times, we found a number of plants which deserve attention, such as *Aquilegia vulgaris*, *Hesperis matronalis*, *Valeriana pyrenaica*, *Campanula latifolia*, *Epilobium angustifolium*, *Polygonum Bistorta*, *Prunus Padus*, *Lysimachia nemorum*, *Ruscus aculeatus*, *Carex remota* and *Scolopendrium vulgare*. Some of these species, however, have undoubtedly escaped from the garden. *Betula alba* and *glutinosa* were also seen. The latter is looked upon by most botanists as a mere variety of the former, but Mr. Babington thinks that he has found a marked character in the stipules, which in *B. glutinosa* are rolled back, while in *B. alba* they are circinate. The form of the fruit, he also thinks, is different in the two cases. In a pond near Ealabus grow *Lycopus europæus*, *Potamogeton natans* and *Nymphæa alba*. On making a transverse section of the petiole of the *Nymphæa*, it was observed that the large tubes had hairs in their interior, which generally came off in threes. Again, in making a similar section of the peduncle, or flower stalk, we noticed generally four or five large tubes in the centre and smaller ones around, but in none of them could any hairs be detected. These tubes in the stalks of the flower and leaf appear to contain air for the purpose of floating the various parts of

the plant.* *Carex vesicaria* and *Equisetum limosum*, both in an unbranched and branched state, were picked at Loch Skiros.

On examining some of the Carices and grasses, it was found that the rule in regard to the solid stem in the former and the hollow stem in the latter was not universal. Thus *Carex remota* and *ovalis* had distinctly hollow stems, while *Ammophila arundinacea* had a solid stem. This grass is said by Dr. Parnell to be the only British one with a stem always completely solid.† It also differs from other grasses in not having a striated stem. It may also be remarked here, that in the Umbelliferæ the character founded on the fistulose stem does not invariably hold good, for on the same root solid and fistulose stems will be occasionally found.

Many of the grasses in Islay displayed much of the ergot, or that disease which is common in rye, and which is an altered state of the ovary caused by the attack of a fungus, *Ergotætia abortifaciens* of Quekett. This plant produces sporules, which communicate the disease to healthy grain, either by being directly applied, or by being taken up from the soil. Mr. Quekett has produced the disease artificially by watering healthy plants of rye with water containing the sporules. Proper draining will probably prevent the attack of ergot. Ergot injures the quality of the flour, and cases are detailed in which the use of diseased rye has caused dry gangrene. The disease is not, however, peculiar to rye; it occurs in many grasses. Professor Henslow has observed it in wheat in Suffolk, and in the district in which he saw it, it is stated, that about a century ago, several cases of poisoning occurred from diseased wheat. Our party observed ergot in considerable quantity on *Anthoxanthum odoratum*, and on *Phalaris arundinacea*. The former grass is very abundant in many parts of the island, and is well deserving of cultivation. Besides the ergot, we noticed the disease in oats caused by a species of *Uredo*, and commonly called smut. In many fields the disease was very prevalent. It is said to be prevented by steeping the grain in stale urine and afterwards sifting lime on it. A solution of salt and a weak solution of sulphate of copper have also been employed.

August 19th. — The day was very unpromising, and thick mist and

* On examining the peduncle of *Nymphæa alba* lately, in Bute, I detected hairs in its tubes as well as in those of the petiole. The same thing was seen in the peduncles and petioles of *Nuphar lutea*. In the latter plant, the air-tubes in the petiole were larger than those in the peduncle, and displayed the hairs most distinctly.

† See Dr. Parnell's able work on British Grasses. *Bromus patulus* and some other foreign grasses have also solid stems, and Mr. Gorrie has noticed the same occurrence in some varieties of wheat.

rain set in about 7 o'clock, A. M. Nevertheless, four of the party started in a conveyance for Portnahaven, while the rest went to Ballagran Loch, to fish. The south-western shores of the island, as far as Portnahaven or the Rhins are low, gravelly, and occasionally rocky, and consist chiefly of clay-slate, with greywacke slate in alternate beds. Gneiss is met with in some parts of the shore, especially between Octofad and the point of the Rhins or Rinns. These shores produced few plants of interest. *Geranium pratense* was noticed near Port Charlotte, and in a neglected garden at the same place we observed profusion of *Papaver somniferum*, of a pink colour, with dark spots at the base of the petals, similar to what occurs in *Papaver Argemone*. The same variety was picked by Dr. Parnell at Ballagran. At Portnahaven there is a lighthouse on an island close to the shore, and there are other islands in the neighbourhood. The tides in this quarter, more particularly at the point of the Rinns, are very violent and rapid, and it is interesting to notice the agitation which is caused even by a moderate degree of wind. On arriving at Portnahaven the weather was so bad and the rain so heavy, that two of the party did not choose to quit the conveyance, and accordingly they proceeded directly to Kilchearan, and there enjoyed the hospitality of Mr. Ralston, until the other two botanists met them.

Proceeding along the western shore of the Rinns from Portnahaven, we encounter a very rugged and rocky coast, intersected by numerous indentations, and broken up by narrow ravines, into which the sea enters with great violence. Fine caves, and gigantic natural arches occur in many places. The prevailing rocks are clay-slate and greywacke, with occasional trap dykes of considerable extent. In some places, as at Sosset Hill, we meet with a peculiar kind of conglomerate. Near Sosset, which is a fishing village, the cliffs are remarkably fine, attaining a height of many hundred feet, and covered with innumerable sea-fowl. In this quarter there are the remains of a fort.

The most interesting plants seen on the cliffs were *Sedum Rhodiola*, *Pyrethrum maritimum*, in some cases with a singular flattened or fasciated stem, caused apparently by the union of several stalks, *Ligusticum scoticum*, *Carex extensa*, *Spergula subulata* and *Inula dysenterica*. The cliffs are now and then interrupted by sandy shores covered with bent, and there *Convolvulus Soldanella* and *Equisetum Telmateia* were found, along with *Galium verum* curiously altered by the attacks of insects.

At Kilchearan, where a slate-quarry is worked, we joined the rain-dreading botanists, whom we found comfortably accommodated in the house of Mr. Ralston, the tenant of the farm in this quarter, who

kindly entertained the whole party. Mr. Ralston seems to be an intelligent farmer, and has contributed to the improvement of the agriculture of this district. He pointed out to us a field of from twenty to thirty acres, bearing an excellent crop of wheat. He has introduced Cheviot sheep with profit, and in his dairy he has the Ayrshire breed of cows, to the excellence of the produce of which, some of the party can bear testimony.

Returning by the shore to Ealabus, we did not observe any plants of peculiar interest. On our return, we had the pleasure of meeting Mr. Christison, who had been sent to this county by the Norwegian government for the purpose of getting information as to agriculture. Foreign governments, in the encouragement which they thus give to science, set an excellent example to Britain.

August 20th.—This day the botanical section proceeded first by the shore and then across the island to Loch Gruinart, examining the southern shore of the Loch, and going as far as Ardnave and the point of the Nave. The rest of the party indulged their fishing propensities by visiting the river Laggan. The day was showery, but upon the whole favourable.

In the salt-marshes near Islay House many common sea-plants were found, as *Salicornia herbacea*, *Glaux maritima*, *Aster Tripolium* and *Poa maritima*. In a ditch near Gruinart, *Rumex Hydrolapathum* or great water-dock was picked, a species well distinguished by its lanceolate acute leaves, tapering below into a petiole, which is flat above, and by the enlarged ovato-triangular divisions of its perianth nearly all with tubercles. It was formerly described by botanists as *Rumex aquaticus*, a distinct species, with broader leaves, not tapering, and non-tubercled fruit, hence called grainless dock. *R. Hydrolapathum* is rare in Scotland, although it is found in many places in England. Mr. Stewart Murray observed the plant in ditches near Meikleoun, in Perthshire, and I have a specimen from the station, picked by Mr. Gorrie. Hopkirk mentions the plant as growing near Old Kilpatrick, on the Clyde, but I have not been able to see it in that locality. I have gathered the plant abundantly near Oxford and in other parts of England, but I never before picked it in Scotland.

The shore on the south side of Loch Gruinart is partly gravelly and partly sandy. The sand occurs near the Nave, and on the west shore exposed to the Atlantic. The dunes of sand in this quarter attain a great elevation, and are, as usual, kept together by grasses and sedges. In lint fields near Gruinart, *Camelina sativa* was observed, and on the sandy shores *Draba incana*, *Gentiana campestris* and

Amarella and *Arabis hirsuta*. *Scutellaria galericulata* grew profusely among the pebbles on the shore, *Papaver Argemone* and *dubium* in sandy fields, and *Juncus maritimus* in salt marshes: in moist places near the loch, *Callitriche verna* and *pedunculata*, *Potamogeton pusillus* and *crispus*, *Helosciadium inundatum*, *Myriophyllum spicatum* and *Scirpus glaucus*.

Loch Gruinart has a sandy bottom, and it is nearly emptied when the tide is low. Sand-banks exist in many places, and on these we saw numerous seals sporting in the sun. The tide flows here with great rapidity. A bar of sand extends across the mouth of the Loch, and at its head there is an alluvial plain. The shores to the south-west of the point of the Nave are rocky and inhospitable, and exhibit reefs of various extent. The cliffs become more elevated as we proceed south and caves occur in many places. The interior of the island in the neighbourhood of Loch Gruinart is composed of boggy and peaty soil, furnishing such plants as *Droseras*, *Rhynchospora alba* and *Utricularia minor*. On Nave Island *Crambe maritima* is said to grow.

In this part of the island there are the ruins of the old church of Kilnave. It is a building of considerable antiquity, and seems to have had only two windows, the arches of which are very peculiar. In the church-yard there is an old stone cross, which differs in the curvature of the cross portion from those seen at Campbelton and in Iona.

August 21st.—Early this morning I started for Ballytarson, and gathered *Anthemis nobilis* in abundance. This plant is by no means common in Scotland. In Islay it occurs in several places, and always associated with limestone rock. After breakfast we prepared for a visit to the south-eastern district of the island, but the stormy nature of the weather caused no small alarm to some of the party, and the number of zealous botanists willing to encounter a long and wet walk was found to be very small. One of the party preferred botanizing near Ealabus; within sound of the dinner-bell. Undismayed by the desertion of friends, our little band proceeded in one of Mr. Chieve's conveyances as far as Kintra, at the southern extremity of Laggan sands, and thence walked towards the Oe. On the sands the chief plants were *Convolvulus Soldanella*, *Poa pratensis* var. *arenaria* and *Koeleria cristata*. On none of the sands in the island did we observe *Sinapis monensis*, a plant which is common in many of the sandy shores on the west coast.

From Laggan sands we proceeded along the rocks to Slochd Mhaol

torrai* where splendid precipices and caves are seen. The rocks in this district, and indeed all the way from Islay House to the Mull of the Oe, consist of alternations of a bluish quartz rock, clay-slate and occasional trap dykes and veins. Some of the rocks are bent and contorted in a remarkable manner, and others are hollowed out into enormous caves, some of which extend a great way inland and open at the distance of several hundred feet from the shore. Some of the rocks stand out prominently in the sea, with rugged and peaked summits. One of these is called "Saighdair Ruadh," or red soldier rock, from its colour. It is 150 or 200 feet high, and presents a very remarkable aspect. There are often very narrow chasms or rents in the rocks, into which the waves of the ocean are rolled with great force. Land-slips have also occurred in some places. The rocks, although interesting in their appearance, are by no means productive. *Beta maritima* grows in considerable quantity on some of the cliffs, and *Sedum Rhodiola* and *Pyrethrum maritimum* abound. The other plants worthy of notice were *Listera ovata*, *Luzula pilosa*, *Lastræa Oreopteris*, *Ligusticum scoticum*, *Lycopodium selaginoides*, *Hypericum humifusum* and *Androsæmum*, *Rubus saxatilis* and *Saxifraga aizoides*. The last mentioned plant extends from nearly the sea-level to a considerable elevation on the hills.

After examining the rocks in the Oe or Oa, a parliamentary parish, we proceeded to the Moile or Mull of Islay, passing lower Killian, where oddly twisted rocks are seen. The Moile is a fine cliff or promontory projecting into the sea, forming the south-eastern extremity of Islay, and surrounded by cliffs of a reddish colour, in which the alternations of quartz rock and clay-slate are well seen. On one of these rocks there are the remains of an old fort, called Dunad or Dùn Athad, which seems to have been a place of great strength in former times. The rock on which it is situated projects towards the sea, is bounded on three sides by perpendicular cliffs, and is connected with the land only by a narrow isthmus with precipices on each side. In some of the rocks near the fort remarkable caves and arches are seen. After examining the fort we proceeded through upper Killian parish towards Port Ellen. We passed Kinnabus and Assabus Loch, and at Cragabus we saw the remains of an old church-yard, marked by large stones placed so as to enclose graves, similar to some which

* This means the gulf of Mhaol torrai, a person concerning whom there is some tradition. He is said to have been killed at the place in endeavouring to leap across one of the chasms on horseback.

occur near Lag, in the island of Arran. The party reached Port Ellen about 8½ P. M., after a long and fatiguing walk. At this port a lighthouse has been erected by Mr. Campbell.

August, 22nd.—Leaving Port Ellen at 7, A. M., we went along the shore to Ardinisteil, where we breakfasted with Mr. Stein. On our way we picked *Galeopsis versicolor* and *Convolvulus sepium*. After breakfast we directed our course towards Loch Knook or Knook-hill, where Mr. Campbell has a summer residence, called Ardimersay cottage. Here there is a considerable extent of thriving plantations, and we spent some hours in the examination of them. The chief plants which rewarded our exertions were, *Circæa intermedia*, *Carex lævigata*, *Hymenophyllum Wilsoni*, *Polypodium Phegopteris*, *Cardamine sylvatica* and *Prunus Cerasus*. On the rocks in the neighbourhood were seen *Milium effusum*, *Tanacetum vulgare* and *Inula Helenium*, evidently an escape from an old garden. Near the cottage there is an old fort, now in ruins, called Dun Naomhaig, and pronounced Dunavaig, remarkable as being the last held by the MacDonalds. It was taken by the Campbells, who, it is said, resorted to the method of cutting the water-pipes, which were conveyed under the sea in the bay, and thus causing a surrender. The rock of the fort seems to be impregnable on all sides but that next the land. In the vicinity of the cottage a place is shown which is said to be the grave of the Princess Isla.

After partaking of refreshment kindly supplied by the housekeeper at the cottage, we walked partly by the shore and partly inland as far as Kildalton, where porphyritic rocks present themselves. Here a fine old church is seen in ruins. It had two windows in the east end and two at each side, with two doors. Two stone crosses differing slightly in character are seen, one in the church-yard surrounding the chapel, and the other at a little distance from it. Some curious old grave-stones occur. Nettles and *Anthriscus sylvestris* now grow in profusion within the precincts of the chapel; and the procumbent variety of the common juniper on its walls. The various species of nettle seem to follow the footsteps of man, and delight to grow in places where nitrate of lime is produced.

“ At the wall's base the fiery nettle springs
With fruit globose and fierce with poisoned stings.”

In boggy places in the vicinity of the old chapel, we found *Helosciadium nodiflorum*, *Hypericum elodes*, *Carex remota* and *filiformis*.

This part of the island is separated from the district near Islay House by a lofty range of hills, some of them attaining an elevation of 1500 or 2000 feet, and composed chiefly of quartz rock. We ascended one of them called Ben Vigors, or Ben Bhiggars, and found it by no means productive. The principal plants collected were *Gnaphalium dioicum*, *Lycopodium Selago*, *Arctostaphylos Uva-ursi*, *Carex rigida*, *Armeria maritima* var. *alpina*, *Juniperus communis* var. *nana*. The occurrence of *Arctostaphylos* would probably indicate an elevation of at least 2000 feet, corresponding with the sub-alpine region of Mr. Watson. On reaching the summit of the hill we were involved in mist and rain, and the guide who accompanied us lost his way, and after wandering for an hour or two landed us in the valley whence we had ascended. Fortunately he knew the direction which our place of destination bore to the valley and accordingly we followed our compass and crossed the hills in a very thick mist, amidst the fears and doubts of our guide as to the correctness of our procedure. Our anxiety as to the result of our exploration made us forget all the discomfort of a thorough drenching, and one of the party who had been complaining sadly of fatigue now walked on most manfully. After reaching the summit of the range of hills (probably the summit of Gloan Leor), we descended, not without doubts as to the result. At this time a slight clearance took place in the mist, and we descried some green patches of verdure which seemed to indicate a limestone district. We knew that this was the geological nature of the district which we wished to reach, and our hopes of extrication from our difficulties brightened considerably. We now proceeded on our descent with increased vigour and alacrity, and reached Allaladh, where some oat-cakes and milk from one of the cottagers were most thankfully received, and ere long we had the pleasure of finding ourselves at Catladale, where a conveyance was waiting to convey us to Ealabus. This adventure shows, in a certain degree, the importance of knowing the geology of a district and the kind of vegetation which is connected with particular rocks. The limestone district to which I have alluded is extensive. It crosses from Laggan to Ardmore point and extends to the north-east of Islay House. In some places the water has hollowed out a passage for itself through the rocks, and in one instance we observed the rivulet disappear under ground for several hundred feet. Near Catladale the ruins of a fort are seen, called Nose-bridge fort.

To be continued.

Observations on Mr. Marshall's Experiments with the Seeds of the Cowslip and Oxlip. By HEWETT C. WATSON, Esq., F.L.S.

WILL Mr. Marshall allow me to call upon him for some additional explanation of his experiments in raising cowslips and oxlips from seeds, as recorded in the August number of the 'Phytologist' (Phytol. ii. 285)? He apparently draws a "conclusion" from those experiments, which is not supported by the facts stated.

Mr. Marshall writes that he raised many plants from the seeds of one wild cowslip, which had been transplanted into his garden; the result being, that "every individual of them was a mere cowslip, in all respects like its parent, not one of the sixty individuals having sported either in form or colour." If this is to be understood literally as expressed, it is such a result as I have scarce ever met with in the case of any species of plant. But if it means, as is more likely, that the sixty plants differed only to the extent (not inconsiderable) to which wild cowslips differ among themselves, then the result is closely in accordance with those which have fallen under my own observations upon the seedlings of *Primula veris*. Still, I do not see how or why the fact of a cowslip producing only cowslips, on one occasion, should "lead to the conclusion, that there must have been 'a hitch' somewhere in the recorded experiments" . . . "of Mr. Watson;" since my experiment was made with seeds of an oxlip-variety of the *Primula vulgaris*, not with those of a cowslip. The tendency to vary again, as far as my experience goes, is much greater with the progeny of a variety, than with that of a typical example of a genus.

Mr. Marshall afterwards mentions that he sowed "a few seeds of the oxlip, with a similar result." Without knowing *what* oxlip is intended, I cannot say whether this other experiment bears any more closely upon that which I have recently recorded in the 'Phytologist' (Phytol. ii. 217). Was it Jacquin's *Primula elatior*?—or the large-flowered and flat-limbed variety of *Primula veris*?—or the common umbellate variety of *Primula vulgaris*?—or that cowslip-looking variety of the last, which (for sake of distinction) I have usually designated the "Claygate oxlip," and which is the *Primula vulgaris*, *var. intermedia* of the London Catalogue. These various oxlips (except the large-flowered *P. veris*) must now be familiar to many readers of the 'Phytologist,' by the specimens distributed through the Botanical Society of London. It has already been stated in the 'Phytologist,' that Jacquin's *Primula elatior* comes up true from seeds sown in the garden (Phytol. i. 975). But I should now be greatly surprised to find

numerous seedlings of any umbellate variety of *P. vulgaris* coming into flower without variation from the parent form. As our native species and varieties of *Primula* were not sufficiently understood at the date of Professor Henslow's experiments, some doubt will unavoidably arise about it; and perhaps we should take the result as a suggestion rather than a proof.

HEWETT C. WATSON.

Thames Ditton, August, 1845.

Some words on "Species-making." By HEWETT C. WATSON,
Esq., F.L.S.

IN the August 'Phytologist,' Mr. Lees has hastily taken to himself my incidental mention of the genus *Rubus*, among others, in example of the species-making taste now in vogue; and he has indited half-a-dozen pages of verbal vengeance against me, under the inspirations of the cap which he has supposed to fit his own head (*Phytol.* ii. 263). I can assure Mr. Lees, however, that there was no intention of alluding to him individually by the example; and that he is perfectly at liberty to read *Salix*, *Poa*, or any other be-species-ed genus, instead of *Rubus*, as an illustration of the remark, which had a general application to the practice of species-making on slight grounds, without reference to any particular individual whose taste may lead him to join the section of species-makers. I do not recollect that I ever publicly connected the name of Mr. Lees with any remark which could be fairly construed into the expression of a feeling at variance with those of good will and respect towards that gentleman. On some occasions, in epistolary or oral communications with other botanists, I have found it necessary to give them a hint against relying too implicitly on his botanical exactness, and some such hint may have been repeated to him. But I have not done this on slight grounds.

The immediate object of this paper, is to rescue my own printed remarks from the erroneous construction put upon them by Mr. Lees, and likely to be adopted by readers equally "cursory" as the thinker in the 'Phytologist.' It is not to "the observation of minute differences in plants" that I ever objected, but to the hasty practice of species-making, as soon as such differences are observed, although there may exist little or no other reason for supposing the plants to be genuine species. Mr. Lees adroitly enough turns the attention of his readers from this essential distinction, by a stratagem which would

look more available in a legal pleader than in a writer on science. After imperfectly quoting my words "about the frivolous attempts at species-making," he puts an interrogation,—“But why this objection to ‘species-making,’—or rather the observation of minute differences in plants?” And by thus connecting together two things so totally different, he is then enabled to hold me forth to his readers in the character of one who objects to the observation of minute differences, and who decries the attentive examination of species!

This is unjust towards me, individually, and not much less so towards those readers whose judgment would be distorted by such a strategic connexion of things quite dissimilar. There may be some egotism in the illustration, but I will appeal to my own practice in proof of the distinction. During several years past I have been in the habit of collecting examples of variation in plants from every available source, and several of these have been already put on record in books, or distributed as specimens for the herbaria;—but nobody has yet charged me with being one of the species-makers. The study of varieties, and the love of species-making, are thus completely dissevered in practice; and therefore the strongest objection expressed against the one custom, cannot justly be construed into any censure of the other.

I shall still venture to repeat my own conviction, that science is much impeded by the prevalent habit of raising varieties to the rank of species (as it is expressed), without first taking the pains to ascertain whether they merge into known species during cultivation or through intermediate examples. Things which are obscure and uncertain are thus equalized with those which are clear and certain, error becomes largely commingled with truth, and the difficulties of scientific definition are greatly increased.

On the contrary, I conceive that experiments have a decided tendency to promote science, by removing error, and by substituting certainty in place of obscurity. Suppose, for instance, I find a wild plant which is distinguishable from known species by some peculiarity which could readily be described after the manner of drawing a specific character. Two courses are open. I may at once invent a specific name, write a specific character, and publish the plant as a new species. Or, I may first diligently seek for other examples which will suffice to connect it with a known species, observe it when cultivated under different conditions of soil, and raise it afresh from seeds. The species-maker takes the former course; while the experimenter takes the latter—at least in the first instance. I do not think that

the species-maker would here be manifesting the greatest love of truth, or the smallest zest for notoriety.

HEWETT C. WATSON.

Thames Ditton, August, 1845.

Plants collected in Westmoreland &c. in July, 1845.

By JOSEPH SIDEBOTHAM, Esq.

I SEND you a list of a few of the rarer plants collected during a short visit to the lakes of Westmoreland &c., in July, which may be interesting to some of your readers.

Thalictrum minus, var. β . *majus*. On the mountains above Patterdale.

Hypericum calycinum. Road-side near Brathay, in several places, probably escaped from a garden.

Saxifraga aizoides and *stellaris*. On the borders of most of the mountain streams, very fine on Langdale Pikes.

Saxifraga hypnoides, var. β . *platypetala*. In a ravine in Patterdale.

Lobelia Dortmanna. Rydal-lake &c., abundant.

Primula farinosa. This beautiful plant, which I here met with for the first time, grows plentifully on swampy ground and the borders of mountain streams.

Juncus filiformis. Derwent-water.

Carex rigida. Helvellyn, above Red tarn: the foliage was in a beautiful state.

Salix herbacea. In flower on Swirrel-edge, Helvellyn.

— *reticulata*. Mountain above Brother's water, Patterdale.

Poa nemoralis. Stock-gill, Ambleside.

Allosorus crispus. Some of the mountain sides were completely green with tufts of this beautiful fern.

Asplenium viride. Wet rocks above Patterdale.

Hymenophyllum Wilsoni. In fructification in Patterdale, Stock Gill and Langdale Pikes.

Isoetes lacustris. In Rydal-lake.

Lycopodium selaginoides. Very fine and abundant on wet banks &c. Some specimens gathered on Loughrigg were four inches high.

Andræa alpina, *Rothii* and *rupestris*. Helvellyn &c.

Bartramia Halleriana. In fruit in a ravine near Brother's water.

Bryum crudum. Scawdale Fell, Patterdale.

— *elongatum*. Abundant on the sides of mountains.

Bryum julaceum. In fruit, Stock Gill, Ambleside, at the foot of the waterfall, Helvellyn and Langdale Pikes.

—— *turbinatum* ? Rocks near the summit of Helvellyn. This differs considerably from *B. pallens*: Mr. Wilson thinks it may be a form of the true *B. turbinatum*, (*B. & S.*)

—— *pseudotriquetrum*, (Schwgr.) Langdale Pikes.

—— *erythrocarpon*. On the ground near Rydal lake.

Dicranum scoparium and *Dilleni*. Both in good fruit at Stock Gill, and Rydal-park.

Diphyscium foliosum. On many of the mountains: abundant at Langdale and Grassmere.

Hedwigia æstiva. Plentifully in fruit upon wet rocks: Langdale Pikes.

Edipodium Griffithianum. Among stones, summit of Helvellyn.

Pterogonium gracile. On walls about Ambleside, where it fruits sparingly.

Weissia fugax, (Hedw.) *W. striata*, *H. & T.* Mountains above Grassmere and Langdale Pikes.

JOSEPH SIDEBOTHAM.

Manchester, August, 1845.

Proceedings of Societies.

BOTANICAL SOCIETY OF LONDON.

September 5, 1845. — J. E. Gray, Esq., F.R.S. &c., President, in the chair. The Secretary announced that British plants had been received from Dr. Bossey, Dr. Wood, Dr. Dewar, Dr. Taylor, Mrs. F. Russell, Mr. S. Hailstone, Mr. Freeman, the Rev. W. S. Hore and the Rev. C. A. Johns.

Mr. William Mitten presented a specimen of a species of *Carex* [described in the present number of the 'Phytologist' under the name of *Carex montana*, *L.*] but owing to the imperfect condition of the one specimen before the Society, in which the flower-stems had withered, without perfecting fruit, it could not be certainly referred to the *Carex montana* of continental authors. The specimen was collected by Mr. M. in July last, "in the county of Sussex, about a mile south of Tunbridge Wells, in the way to Eridge."

Read, a communication from Mr. T. Bentall, On the *Luzula congesta* of British authors, in which Mr. B. supported the views set

forth in Koch's Synopsis, and repeated in Babington's Manual, where the plant is described under the specific name of *Luzula multiflora*.

Mr. Bental's remarks run as follows : —

"I beg to lay before the Botanical Society the enclosed specimens of *Luzula multiflora* (Babington's Manual), which, after a close examination, I am disposed to consider as a perfectly distinct species, although often confounded with *Luzula campestris*. This error has probably arisen from the great variation of the inflorescence in different specimens. The flowers are often collected into an almost orbicular head, when it becomes the *Luzula campestris*, *β. congesta*, of Hooker and others; at other times they form a panicle of numerous sessile and stalked clusters, when it bears a strong resemblance to the common form of *Luzula campestris*, and is often mistaken for it.

"There appears to be a decided and strongly marked difference in the form of the seeds of the two plants, those of *multiflora* being usually nearly twice as long as broad, whilst those of *campestris* are nearly globular; the basal appendage with which they are furnished I find to be much more conspicuous in the latter than in the former. The character pointed out by Mr. Babington as existing in the filaments, I believe to be constant. *Luzula multiflora* generally inhabits woods and shady places, being seldom found in dry open pastures, in which *campestris* usually abounds."—*G. E. D.*

BOTANICAL SOCIETY OF GLASGOW.

May 27, 1845. — The Society met in the College, Dr. Balfour, the President, in the chair.

Dr. Balfour exhibited a spathe of *Areca oleracea*, upwards of four feet in length; also specimens of the stem of the guaiac tree, rosewood tree, and Moreton-bay pine; specimens of American ferns, belonging to the section *Osmundaceæ*; the fruit of *Cocos lapidea*, with the concrete oil obtained from it; a specimen of *Cycas revoluta*, with the seeds developed on the peculiarly altered leaves; and hazel-nuts, presented to him by Mr. Kidley, which had been found in a peat-moss under sand, the pericarp being soft and natural, while the kernel was hardened by a siliceous deposit.

Dr. B. then gave an account of a botanical trip to Castlereay, Denny, the banks of the Carron and Falkirk, on the 24th of May. Among the more interesting plants gathered were *Adoxa moschatellina*, *Viola lutea* both yellow and blue, *Paris quadrifolia*, *Stellaria nemorum*, *Melica nutans*, *Carduus heterophyllus* with entire and pin-

natifid leaves on the same stem, *Prunus Padus*, *Polypodium Dryopteris*, *Trollius europæus*, *Potentilla Fragariastrum*, *Ranunculus auricomus*, *Myrrhis odorata*, *Geranium sylvaticum*, *Orchis mascula*, &c. He also gave an account of excursions to Arran on the 4th and 5th of July, 1844; and to Toward-point, and the shore between that and Dunoon. The discovery of *Carex vesicaria* and *Thalictrum flavum* in the latter quarter was particularly noticed.

Dr. Balfour laid on the table Mr. Keddie's prize herbarium, which Mr. K. kindly proposed to incorporate with the Society's collection, on the condition that it is to be accessible, under proper regulations, to the students of the botanical class in the University.

June 24, 1845. — The President in the chair.

Dr. Balfour exhibited growing specimens of *Cypripedium pubescens* and *spectabile*, from the Botanic Garden. The specimens had been transmitted by Dr. Gavin Watson, of Philadelphia. Dr. B. also gave a description of the plants belonging to the section *Cypripediæ* of the natural order *Orchidaceæ*, and explained the structural characters. The remarks were illustrated by dried specimens from North America, Siberia, Europe, Brazil and Nepaul. Of twenty species of *Cypripedium* mentioned by Steudel, one is found in Britain and in other parts of Europe, four in Siberia, six in North America, four in Brazil, three in Nepaul, one in Japan and one in the Malay Archipelago.

Dr. Balfour next exhibited a large specimen of the root of *Calotropis gigantea*, which had been sent from Scinde, by Lieut. MacLagan, of the Engineers. The plant belongs to the natural order *Asclepiadaceæ*, and receives the name of the Mudar or Madar plant. It is common in India, where it attains a large size. Specimens of the plant were exhibited. The bark of the root furnishes the article of *Materia Medica* called Mudar, which is used in various affections of the skin, and in rheumatism as a diaphoretic. The juice of the plant is acrid and milky; and a principle called Mudarrin was detected by the late Dr. Duncan, of Edinburgh, which is remarkable for the property of gelatinising on being heated, and becoming fluid on cooling.

Dr. B. then showed dried specimens of *Cheirostemon platanoides*, the hand-tree or Manitas of South America, and explained the peculiar structure of the stamens.

A specimen of *Androsace alpina* was exhibited, which had been gathered by Dr. Barry on Mont Blanc, at the height of 10,000 feet.

Dr. Balfour then gave a short account of botanical trips with his pupils to Roseneath, Ross, Largs and Wemyss-bay, Dumbarton and

Bowling; and noticed some of the more interesting plants collected, such as *Hymenophyllum Wilsoni* in Ardenconnel Glen, *Valeriana pyrenaica*, *Cardamine amara*, *Sedum Telephium*, *Carum verticillatum*, *Oenanthe crocata* exhibiting no orange juice when cut, *Rumex sanguineus*, *β. viridis*, *Milium effusum*, *Sagina maritima*, *Raphanus maritimus*, *Sinapis monensis*, *Steenhammera maritima*, *Trollius europæus*, *Mimulus luteus*, naturalised near Largs, *Pinguicula lusitanica*, *Osmunda regalis*, *Peucedanum Ostruthium*, *Lysimachia Nummularia*, *Asplenium marinum*, *Smyrniolum olusatrum*, *Carex muricata*, *Inula Helenium*, *Conium maculatum*, *Malva moschata* and *sylvestris*, *Poa maritima*, *Geranium Columbinum*, *Allium vineale* and *Solanum Dulcamara*.

Dr. Balfour also gave a detailed account of an excursion to Loch Winnock and Castle Semple woods, and exhibited most of the plants collected, in a fresh state; such as *Nuphar lutea*, *Ranunculus Lingua*, *Hippuris vulgaris*, *Carex acuta* and *vesicaria*, *Aconitum Napellus*, *Hesperis matronalis*, *Serrafalcus commutatus*, *Sedum villosum* and *S. Telephium*, *Littorella lacustris*, *Staphylea pinnata*, *Berberis vulgaris*, *Lythrum Salicaria*, *Spiræa salicifolia*, *Verbascum Thapsus*, *Acer campestre* and *Epipactis latifolia*. He described the gardens at Castle Semple, which are very extensive. The quantity of glass in the vineries, peach and pine houses, greenhouses and stoves, is probably unequalled in any private garden in Scotland. The party were received most hospitably by the proprietor, Colonel Harvey, who accompanied them through the woods in the neighbourhood of the Castle. In the plantations, some fine cedars, larches and oaks were observed.

It was agreed, on the motion of the President, that the Committee on the Flora of Glasgow, formerly appointed, be authorised to make up a Catalogue of British Plants, to be published under the direction of the Glasgow Botanical Society.

A specimen of *Cirsium setosum* of Bieberstein was received from Dr. Dewar of Dunfermline, for the herbarium.

Dr. Röttinger, curator of the herbarium, exhibited specimens of the following vegetable alkaloids: — viz., Morphin, Meconin, Codein, Narcotin, Solanin, Atropin, Delphinin, Lactucin, Emetin, Berberin, Aconitin, Veratrin, Picrotoxin, Brucin, Peucedanin, Cinchonin, Jalapin, Esculin, Santonin. — J. H. B.

Account of a Botanical Excursion to the Mull of Cantyre and the Island of Islay, in August, 1844. By J. H. BALFOUR, M.D.

(Concluded from page 312).

THE party left at home had made some additions to the Flora of the island during our absence, by gathering *Ruppia maritima*, *Potamogeton rufescens*, *Polemonium cæruleum*, *Malva moschata*, *Carex acuta*, *Solanum Dulcamara*, and *Rubus affinis* of Weihe and Nees, a species described in Mr. Babington's Manual, and the specimen named on his authority.

August 23rd.—This day, like its predecessors, was gloomy and unpropitious, and acted in the most cooling manner on the enthusiasm of the party. One gave up Botany for shooting, others remained at home, and a party of two only kept up the credit of the expedition. This party bent their steps towards Losset, passing Kilmeny and Ballygrant. At the latter place there is a beautifully wooded lake, well stocked with trout, some of them presenting peculiar characters. On the way *Ranunculus aquatilis*, var. *fluitans*, *Potamogeton pusillus* and *rufescens* were picked. Near Losset, in a glen not far from the Sound of Islay, *Ribes rubrum* grows in profusion, apparently wild, along with *Rubus Idæus* and *saxatilis*. We got fresh specimens from Mr. Stuart. Near Losset there is a lead-mine, which is worked, and there is abundance of iron in the vicinity. From Losset we proceeded to the lake of Finlaggan, or the Loch of Portaneilan, as it is sometimes called, and collected a few common aquatic plants. On an island in the loch stand the ruins of the castle of Finlaggan, famous as the place where the MacDonalds, Lords of the Isles, were crowned. There is no means of reaching the island except by wading, inasmuch as there is no boat on the loch. The water is about four feet deep at the place where the island can be reached. We accordingly had to wade up to the middle in order to get a view of the ruins. The buildings seem to have been extensive. There are the remains of an old chapel, with some antiquated grave-stones, having swords carved on them. The grandeur of this castle of the Lords of the Isles is now gone, and nettles and *Stachys sylvatica*, along with other ignoble weeds, occupy the halls of the MacDonalds. On the walls of the chapel *Asplenium Ruta-muraria* and *Adiantum-nigrum* grow in profusion, filling up every chink and crevice with their fronds. The contemplation of these crumbling walls and the vegetation covering them, recalled to my mind the words of the American poet, who, when speaking of flowers as stars in earth's firmament, and describing the

various lessons which they furnish, goes on to say,—

“ Not alone in her vast dome of glory,
Not on graves of birds and beasts alone,
But in old cathedrals high and hoary
On the tombs of heroes carved in stone.

In the cottage of the rudest peasant,
In ancestral homes whose crumbling towers
Speaking of the past unto the present
Tell us of the ancient games of flowers.

In all places then and in all seasons
Flowers expand their light and soul-like wings,
Teaching us by most persuasive reasons
How akin they are to human things.”

On an island near that already mentioned, and separated from it only by a narrow strait, are the ruins of some buildings where the Lords of the Isles held their councils. The islands were formerly united by a draw-bridge. On one side of the island on which Finlaggan Castle stands there are the remains of a pier, and a similar pier exists on the mainland. In the loch grew *Phragmites communis*, *Nymphæa alba* and *Potamogeton natans*.

From Finlaggan we walked to Duisker, where *Agrimonia Eupatoria*, *Eupatorium cannabinum* and *Festuca gigantea* were found. This being a limestone district the vegetation was luxuriant, and the rocks were undermined in many places by the streams. On our way from this district to Ealabus, we visited Loch Skiros, and gathered *Potamogeton perfoliatus* and *pusillus* and *Callitriche autumnalis*.

In the evening the party were conveyed to Portaskaig, and went on board the steam-boat which was to start early next morning for Tarbet.

Thus ended our Islay trip, one from which all of us derived the greatest gratification, and for which we were deeply indebted to the kindness and hospitality of Mr. Chiene. Without his kind offices we could not have examined the island in the manner we did. He spared no trouble in conveying us to different parts of the island, and in affording us every facility for the prosecution of our researches.

Catalogue of the Phanerogamous Plants and Ferns collected during the Trip to the Mull of Cantyre and the Island of Islay.

The letter C added to a species or variety indicates that it was found in Cantyre only. The letter I that it was found in Islay only. The plants unmarked were found in both places. An asterisk (*) prefixed shows that the plant is doubtfully native.

DICOTYLEDONES.

- | | | |
|-----------------------------------|------------------------------|-------------------------------|
| 1. <i>Ranunculaceæ</i> . | <i>Sinapis arvensis</i> | 12. <i>Malvaceæ</i> . |
| <i>Thalictrum minus</i> | <i>alba</i> | <i>Malva moschata</i> , I. |
| <i>Anemone nemorosa</i> , C. | <i>monensis</i> , C. | <i>sylvestris</i> , I. |
| <i>Ranunculus aquatilis</i> , I. | <i>Raphanus Raphanistrum</i> | 13. <i>Tiliaceæ</i> . |
| <i>hederaceus</i> | <i>β. maritimus</i> , C. | * <i>Tilia europæa</i> |
| <i>Flammula</i> | 7. <i>Resedaceæ</i> . | 14. <i>Hypericaceæ</i> . |
| <i>acris</i> | <i>Reseda Luteola</i> , C. | <i>Hypericum Androsæmum</i> |
| <i>repens</i> | 8. <i>Violaceæ</i> . | <i>quadrangulum</i> |
| <i>scleratus</i> | <i>Viola palustris</i> | <i>humifusum</i> |
| <i>Caltha palustris</i> | <i>canina</i> | <i>pulchrum</i> |
| <i>Trollius europæus</i> , C. | <i>tricolor</i> | <i>elodes</i> , I. |
| * <i>Aquilegia vulgaris</i> , I. | <i>β. arvensis</i> | 15. <i>Aceraceæ</i> . |
| 2. <i>Berberaceæ</i> . | <i>lutea</i> | * <i>Acer Pseudo-platanus</i> |
| <i>Berberis vulgaris</i> , C. | 9. <i>Droseraceæ</i> . | 16. <i>Geraniaceæ</i> . |
| 3. <i>Nymphæaceæ</i> . | <i>Drosera rotundifolia</i> | <i>Erodium cicutarium</i> |
| <i>Nymphæa alba</i> , I. | <i>longifolia</i> , I. | <i>Geranium pratense</i> |
| <i>Nuphar lutea</i> , I. | <i>anglica</i> , I. | <i>molle</i> |
| 4. <i>Papaveraceæ</i> . | 10. <i>Polygalaceæ</i> . | <i>dissectum</i> |
| <i>Papaver Argemone</i> , I. | <i>Polygala vulgaris</i> | <i>robertianum</i> |
| <i>dubium</i> | 11. <i>Caryophyllaceæ</i> . | 17. <i>Linaceæ</i> . |
| * <i>somniferum</i> , I. | <i>Silene inflata</i> , I. | * <i>Linum usitatissimum</i> |
| 5. <i>Fumariaceæ</i> . | <i>maritima</i> | <i>catharticum</i> |
| <i>Corydalis claviculata</i> , C. | <i>Lychnis Flos-cuculi</i> | <i>Radiola millegrana</i> |
| <i>Fumaria capreolata</i> | <i>diurna</i> | 18. <i>Oxalidaceæ</i> . |
| 6. <i>Cruciferaæ</i> . | <i>Githago</i> , I. | <i>Oxalis Acetosella</i> |
| <i>Cakile maritima</i> | <i>Sagina procumbens</i> | 19. <i>Leguminosæ</i> . |
| <i>Crambe maritima</i> | <i>maritima</i> , C. | <i>Ulex europæus</i> |
| <i>Capsella Bursa-pastoris</i> | <i>Spergula subulata</i> | <i>Sarothamnus scoparius</i> |
| <i>Cochlearia officinalis</i> | <i>nodosa</i> | <i>Ononis arvensis</i> , I. |
| <i>Draha incana</i> , I. | <i>arvensis</i> | <i>Anthyllis Vulneraria</i> |
| * <i>Camelina sativa</i> | <i>Arenaria peploides</i> | <i>Medicago lupulina</i> , I. |
| <i>Cardamine pratensis</i> | <i>serpyllifolia</i> | <i>Trifolium repens</i> |
| <i>hirsuta</i> | <i>maritima</i> | <i>pratense</i> |
| <i>β. sylvatica</i> | <i>Stellaria media</i> | <i>medium</i> |
| <i>Arabis hirsuta</i> , I. | <i>holostea</i> , C. | <i>arvense</i> , I. |
| <i>Nasturtium officinale</i> | <i>graminea</i> , C. | <i>procumbens</i> |
| <i>Sisymbrium officinale</i> | <i>uliginosa</i> , I. | <i>minus</i> |
| * <i>Hesperis matronalis</i> , I. | <i>Cerastium glomeratum</i> | <i>Lotus corniculatus</i> |
| * <i>Brassica campestris</i> , I. | <i>triviale</i> | <i>major</i> |
| * <i>β. Rapa</i> , C. | <i>atro-virens</i> | <i>Vicia sylvatica</i> , C. |
| | | <i>Cracca</i> |

Vicia sativa, C.

sepium

hirsuta

Lathyrus pratensis

Orobis tuberosus

20. *Rosaceæ*.

Prunus spinosa

Padus, I.

Cerasus, I.

Spiræa Ulmaria

* *salicifolia*, I.

Dryas octopetala, C.

Geum urbanum, C.

rivale, I.

Agrimonia Eupatoria, I.

Potentilla anserina

reptans, C.

Tormentilla

Comarum

Fragaria vesca

Rubus saxatilis

fruticosus

Rubus macrophyllus

rharnifolius

affinis, I.

plicatus, C.

Idæus

Rosa spinosissima

villosa

tomentosa, C.

rubiginosa, C.

canina, C.

Alchemilla vulgaris

arvensis

Cratægus Oxyacantha

Pyrus Malus, C.

Aucuparia

21. *Onagraceæ*.

Epilobium angustifolium

parviflorum

montanum

palustre

tetragonum

virgatum

Circæa Lutetiana, C.

alpina, *β. intermedia*

22. *Haloragiaceæ*.

Hippuris vulgaris

Myriophyllum spicatum, I.

Callitriche verna, I.

platycarpa

pedunculata, I.

autumnalis, I.

23. *Lythraceæ*.

Lythrum Salicaria

Peplis Portula

24. *Portulacaceæ*.

Montia fontana

25. *Paronychiaceæ*.

Scleranthus annuus

26. *Crassulaceæ*.

Sedum Rhodiola

* *Telephium*

anglicum

acre

Cotyledon Umbilicus, C.

27. *Grossulariaceæ*.

Ribes rubrum, I.

28. *Saxifragaceæ*.

Saxifraga aizoides

oppositifolia, C.

hypnoides, C.

Chrysosplenium oppositifolium

Parnassia palustris

29. *Umbelliferae*.

Hydrocotyle vulgaris

Eryngium maritimum

Conium maculatum

Apium graveolens, C.

Helosciadium nodiflorum

inundatum

Ægopodium Podagraria

Carum verticillatum, C.

Bunium flexuosum, I.

Pimpinella Saxifraga

Oenanthe crocata

Lachenalii

Ligusticum scoticum

Angelica sylvestris

Heracleum Sphondylium

Daucus Carota

Torilis Anthriscus

Anthriscus sylvestris

Myrrhis odorata, C.

30. *Araliaceæ*.

Hedera Helix

31. *Cornaceæ*.

**Cornus sanguinea*, I.

32. *Caprifoliaceæ*.

Sambucus nigra

**Viburnum Opulus*, I.

Lonicera Perilymenum

33. *Rubiaceæ*.

Galium verum

palustre

saxatile

Aparine

Sherardia arvensis

Asperula odorata

34. *Valerianaceæ*.

Valeriana officinalis

* *pyrenaica*, I.

35. *Dipsaceæ*.

Scabiosa succisa

36. *Compositæ*.

Oporinia autumnalis

Hypochæris radicata

Sonchus arvensis

asper

oleraceus

Crepis virens

paludosa, C.

Hieracium Pilosella

murorum, C.

sylvaticum

boreale

umbellatum

Taraxacum officinale

Lapsana communis

Arctium minus

Carduus lanceolatus

palustris

arvensis

Centaurea nigra

Bidens cernua, C.

tripartita

Eupatorium cannabinum, I.

Tanacetum vulgare

Artemisia vulgaris

Gnaphalium dioicum

sylvaticum, I.

uliginosum

minimum, C.

germanicum, C.

Petasites vulgaris

- Tussilago Farfara
 Aster Tripolium
 Solidago Virgaurea
 Senecio vulgaris
 sylvaticus
 Jacobææ.
 aquaticus
 Pulicaria dysenterica
 Bellis perennis
 Chrysanthemum segetum
 Leucanthemum
 Pyrethrum inodorum
 maritimum
 Anthemis nobilis, I.
 Achillea Ptarmica
 Millefolium
 37. *Campanulaceæ*.
 Campanula rotundifolia
 * latifolia, I.
 Jasione montana
 38. *Ericaceæ*.
 Erica Tetralix
 cinerea
 Calluna vulgaris
 Arbutus Uva-ursi, I.
 Vaccinium Myrtillus
 39. *Ilicaceæ*.
 *Ilex Aquifolium
 40. *Jasminaceæ*.
 *Ligustrum vulgare
 *Fraxinus excelsior
 41. *Gentianaceæ*.
 Gentiana Amarella, I.
 campestris
 Erythraea Centaurium
 linarifolia, I.
 Menyanthes trifoliata
 42. *Polemoniaceæ*.
 *Polemonium cæruleum, I.
 43. *Convolvulaceæ*.
 Convolvulus sepium
 Soldanella
 *Cuscuta epilinum
 44. *Boraginaceæ*.
 Myosotis repens, C.
 cæspitosa
 arvensis
 versicolor
 Steenhammera maritima, C.
- Symphytum tuberosum, I.
 Lycopsis arvensis
 45. *Solanaceæ*.
 Hyoscyamus niger, C.
 Solanum Dulcamara, I.
 46. *Scrophulariaceæ*.
 Veronica arvensis
 serpyllifolia
 scutellata, C.
 Anagallis
 Beccabunga
 officinalis
 Chamædrys
 hederifolia, C.
 agrestis
 polita, C.
 Euphrasia officinalis
 Odontites
 Rhinanthus Crista-galli
 Melampyrum pratense
 Pedicularis palustris
 sylvatica
 Scrophularia nodosa
 Digitalis purpurea
 47. *Labiatae*.
 Lycopus europeus
 Mentha aquatica
 sativa
 β. *rubra*, I.
 arvensis
 Thymus Serpyllum
 Origanum vulgare, I.
 Teucrium Scorodonia
 Ajuga reptans, I.
 Lamium amplexicaule, C.
 intermedium
 purpureum
 Galeopsis Tetrahit
 versicolor
 Stachys palustris,
 β. *ambigua*, C.
 sylvatica
 arvensis
 Glechoma hederacea
 Prunella vulgaris
 Scutellaria galericulata
 48. *Lentibulariaceæ*.
 Pinguicula vulgaris
 lusitanica
- Utricularia minor, I.
 49. *Primulaceæ*.
 Primula vulgaris
 Lysimachia nemorum
 Anagallis arvensis
 tenella
 Samolus Valerandi
 Glaux maritima
 50. *Plumbaginaceæ*.
 Armeria maritima
 var. *alpina*, I.
 51. *Plantaginaceæ*.
 Plantago major
 lanceolata
 β. *altissima*, C.
 maritima
 Coronopus
 Littorella lacustris, I.
 52. *Chenopodiaceæ*.
 Chenopodium album
 Atriplex laciniata
 rosea
 patula, I.
 angustifolia
 erecta
 Beta maritima, I.
 Salsola Kali
 Schoberia maritima, C.
 Salicornia herbacea, I.
 β. *procumbens*
 53. *Polygonaceæ*.
 Polygonum Bistorta, I.
 amphibium
 β. *terrestre*
 Persicaria
 lapathifolium
 Hydropper
 aviculare
 Raii, C.
 Convolvulus
 Rumex Hydrolapathum, I.
 crispus
 obtusifolius
 sanguineus, β. *viridis*,
 C.
 acetosa
 Acetosella
 54. *Elæagnaceæ*.
 *Hippophaë rhamnoides

55. *Empetraceæ*.
Empetrum nigrum
56. *Euphorbiaceæ*.
Euphorbia Helioscopia
Mercurialis perennis
57. *Urticaceæ*.
Urtica urens
 dioica
 **Ulmus montana*
58. *Amentifera*.
Quercus Robur
 **Castanea vulgaris*
 **Fagus sylvatica*
Corylus Avellana
Alnus glutinosa
Betula alba
 var. *glutinosa*, I.
- **Populus alba*, C.
 tremula, C.
 nigra, I.
- Salix pentandra*
 fragilis
 alba
 purpurea
Helix
 viminalis
 stipularis, I.
Smithiana
 acuminata, I.
 cinerea
 aquatica, I.
 aurita
 caprea, I.
 nigricans, I.
 fusca, *β. repens*
 rosmarinifolia ? I.
- Myrica Gale*
59. *Conifera*.
Pinus sylvestris
Juniperus communis, *β. nana*
 MONOCOTYLEDONES.
60. *Orchidaceæ*.
Listera ovata, I.
Orchis latifolia
 maculata
Gymnadenia Conopsea
Habenaria viridis
61. *Iridaceæ*.
Iris Pseudacorus
62. *Liliaceæ*.
Allium ursinum, I.
Scilla verna, C.
Agaphis nutans
63. *Asparagaceæ*.
 **Ruscus aculeatus*, I.
64. *Juncaceæ*.
Juncus conglomeratus
 effusus
 maritimus, I.
 acutiflorus
 lamprocarpus
 supinus
 compressus
β. canorus, C.
 bufonius
 squarrosus
- Luzula sylvatica*
 pilosa
 campestris, C.
 multiflora
- Narthecium ossifragum*
65. *Alismaceæ*.
Alisma Plantago
 ranunculoides, I.
- Triglochin maritimum*
 palustre
66. *Fluviales*.
Potamogeton pusillus
 crispus
 perfoliatus, I.
 heterophyllus, I.
 rufescens, I.
 natans
 oblongus
- Zostera marina*
Ruppia maritima, *β. rostellata*, I.
- Lemna minor*
67. *Araceæ*.
Sparganium simplex, I.
 ramosum
68. *Cyperaceæ*.
Schoenus nigricans
Rhynchospora alba, I.
Blysmus rufus
- Scirpus lacustris*, *β. glaucus*, I.
 setaceus
 Savii
 maritimus, C.
 palustris
 multicaulis, C.
 pauciflorus
 cæspitosus
- Eriophorum vaginatum*
 polystachion
- Carex dioica*, C.
 pulicaris
 stellulata
 ovalis
 remota, I.
 intermedia, I.
 arenaria
 vulpina
 Goodenovii
 rigida
 acuta, I.
 flava
 extensa
 fulva
 distans, I.
 binervis
 lævigata, I.
 panicea
 glauca
 filiformis, I.
 hirta, C.
 ampullacea
 vesicaria, I.
69. *Gramineæ*.
Phalaris arundinacea
Anthoxanthum odoratum
Phleum pratense
 var. *nodosum*, C.
Alopecurus pratensis, C.
 geniculatus
Milium effusum
Agrostis canina
 vulgaris
β. pumila, I
 alba
β. stolonifera
γ. maritima, I.

Ammophila arenaria	Festuca ovina	Equisetum palustre
Phragmites communis	<i>β. vivipara</i> , C.	limosum, I.
Aira cæspitosa	duriuscula	var. <i>simplex</i> , I.
flexuosa	elatior	71. <i>Lycopodiaceæ</i> .
caryophyllæa	pratensis, C.	Lycopodium Selago
præcox	gigantea	selaginoides
*Avena strigosa	Bromus asper, C.	72. <i>Filices</i> .
pubescens	Serrafalcus secalinus	Polypodium vulgare
Arrhenatherum avenaceum	commutatus, C.	Phegopteris
Holcus lanatus	mollis	Polystichum aculeatum
mollis	racemosus	<i>γ. lobatum</i>
Triodia decumbens, I.	Brachypodium sylvaticum	Lastræa Oreopteris
Koeleria cristata	Triticum repens	Filix-mas
Molinia cærulea	junceum	dilatata
Catabrosa aquatica	Lolium perenne	Athyrium Filix-fœmina
<i>β. littoralis</i>	var. <i>ramosum</i> , I.	Asplenium Trichomanes
Glyceria fluitans	* multiflorum, I.	marinum
Sclerochloa maritima	temulentum	Adiantum-nigrum
Poa annua	Nardus stricta	Ruta-muraria
pratensis	ACOTYLEDONES.	Scolopendrium vulgare
var. <i>arenaria</i> , I.	70. <i>Equisetaceæ</i> .	Blechnum boreale
trivialis	Equisetum Telmateia	Pteris Aquilina
Cynosurus cristatus	arvense	Hymenophyllum Wilsoni, I.
Dactylis glomerata	sylvaticum, I.	Osmunda regalis, I.
Festuca bromoides		

On reviewing the Catalogue it will be found, that the total number of species collected in Cantyre and Islay is as follows :—

Phanerogamous species	-	-	-	501
varieties	-	-	-	26
				<hr/> 527
Cryptogamous species, ferns, &c.	-	-	-	23
varieties	-	-	-	2
				<hr/> 25

Making a total of 523 species and 28 varieties, in all, 551. Of the phanerogamous species 81 are peculiar to Islay, and of the varieties 9; while 50 phanerogamous species and 10 varieties are peculiar to Cantyre. There are 4 cryptogamous species and 1 variety found in Islay and not in Cantyre.

It will thus be found, that in Islay there were gathered of

Phanerogamous species	-	-	-	451
varieties	-	-	-	16
				<hr/>
				467
Cryptogamous species, ferns, &c.	-			22
varieties	-	-	-	2
				<hr/>
				24

While in Cantyre there were observed of

Phanerogamous species	-	-	-	420
varieties	-	-	-	17
				<hr/>
				437
Cryptogamous species, ferns, &c.	-			18
variety	-	-	-	1
				<hr/>
				19

J. H. BALFOUR.

Glasgow, September, 1845.

Note on Vinca minor in the Isle of Wight. By W. A. BROMFIELD,
M.D., F.L.S.

ALTHOUGH the greater periwinkle (*Vinca major*) does occasionally perfect seed in the climate of Britain, I believe instances in which the lesser periwinkle produces its fruit with us are of such extremely rare occurrence as to have come under the notice of but few observers.* The readers of the 'Phytologist' may therefore feel an interest in knowing that *Vinca minor* ripens its follicles abundantly in a hilly wood, called, I believe, Bottomground Copse, a short half-mile W. N. W. of Idlecombe-farm on the road from Carisbrooke to Shorwell. The copse lies off from the road nearly at the foot of the eastern slope of

* It has been suggested to me by Mr. Smith, of the Kew Gardens, to whom I showed specimens of the fruit not long since, that the seed-vessels are in all probability not so rarely developed as is generally supposed, but merely overlooked, which, from what I have observed and remarked on below, is, I think, likely to be the case.

Buccombe or Bowcombe Down, and is almost completely surrounded by corn-fields. The *Vinca* here grows in most luxuriant profusion over the greater part of the wood, covering the ground with a thick carpet of densely interwoven stems, to the utter annihilation of every plant of weaker vegetating powers than itself. The station is the only one yet known to me in which this species, so common in the mainland woods of Hampshire, is to be seen in a truly natural condition on this side of the Solent. The seed-vessels, though plentifully produced, are not very easily detected amongst the mass of entangled stems and leaves, as they are chiefly found low down on the flowering shoots, their green colour and the prone curvature of the peduncles in this fructiferous state materially aiding their concealment. They appear to be a long time in attaining maturity when the very early flowering of the plant is taken into account, since, though fully grown, but few of the capsules had begun to open and discharge the seed when I last visited the spot (August 22nd), having made but little progress towards ripening in the fortnight before, when I first detected them, but which is perhaps attributable to the cold and moisture then prevailing. In a warmer season they would probably have been in perfection by that time.

The follicles are small (from about half an inch to an inch in length), geminate, parallel to each other or diverging, mostly unequal, and often very much so, one of each pair frequently altogether abortive; oblong, more or less beaked, the apex somewhat obtuse, straight or a little curved; angular, sulcate and glabrous, green, or here and there brownish, coriaceous, bursting along the inner side, and having a pair of small yellowish glands at their base. Seeds two, or (by abortion?) solitary, when in pairs often imperfect, elliptical oblong, subcylindrical, truncate at the ends opposed to each other, with a deep channel along one side, formed by the inflexion of the pale, fleshy, or rather cartilaginous albumen upon the line of placentation, which is parallel to, and close upon, the sutural margins; dull rusty brown, rugose, scabrous, punctate and cellular. Embryo in the axis of the seed, linear, straight, or nearly so. I find the follicles often perforated and the seeds devoured by some insect I have not yet had the means of ascertaining.

W. A. BROMFIELD.

Ryde, Isle of Wight, September, 1845.

Note on Melilotus officinalis. By W. A. BROMFIELD, M.D., F.L.S.

SIR WILLIAM HOOKER gives this as an annual in his 'British Flora,' by most authors it is more correctly marked as biennial or perennial. That it is not annual I have a convincing proof, in its appearance this year in prodigious quantity all over a copse called Bloodstone Copse,* near Ashey in this island, where, previous to the brushwood having been cleared last spring, little or none of the plant was to be seen. At this moment the entire cleared space is filled with tall bushy plants of *Melilotus*, so closely crowded as completely to hide the ground, yet, of the many thousands, I might almost say millions, of specimens, I could find but a single individual producing a small flowering branch, and which was doubtless one amongst the few scattered unnoticed about the copse, that had passed the first year of its growth.

W. A. BROMFIELD.

Ryde, Isle of Wight, September, 1845.

Note on Atriplex hortensis. By W. A. BROMFIELD, M.D., F.L.S.

RAMBLING about a month since upon the shore between Ryde and Binstead, I was much struck by finding an *Atriplex* scattered along the beach, in company with other species of the genus, which appeared wholly new to me. On showing specimens of it in seed to Mr. Babington when down here lately, that gentleman pronounced them to be *A. hortensis*, a plant formerly cultivated in British gardens in lieu of spinach, but at the present day, I believe, wholly disused and forgotten. The locality in which I found it was quite a wild one, namely, on the sea-beach just above high-water-mark, and close under the wooded banks of slipped clay which skirt that part of the coast, growing, as I have said, with other species of Orache (*Atriplex rosea*, *patula*, &c.), either on the bare soil or amidst masses of seaweed. The plant was not abundant, neither was it very sparingly dispersed the whole distance along the line of coast, single plants occurring at moderate intervals for the space of, perhaps, one third of a mile or more. The difficulty is, to account for the appearance of a

* This copse derives its name from the pebbles in a spring which rises here being stained with marks exactly resembling blood, in miraculous commemoration of a sanguinary conflict, which tradition records to have taken place on the spot between the islanders and their Danish invaders. The legend is still current amongst, and devoutly credited by, the rustics of Ashley and its neighbourhood.

plant in so secluded a situation which seems almost to have become extinct with us as an object of cultivation, and even of curiosity. I can find no reference to any modern figure given by British writers of this plant, neither have I ever met with the species in any old-fashioned garden, in which such obsolete productions as this and many other vegetables now discarded are still cherished and preserved. On the continent, indeed, where its employment as a pot-herb is not gone out of date, the garden Orache occasionally finds a place in the European Floras, from becoming naturalized about the site of its cultivation; but I was little prepared to see this native of eastern Asia growing as if perfectly at home on a lonely part of our own coast. I can only conjecture that the seeds may have been thrown ashore from some foreign vessel, feeling pretty confident that no such species of *Atriplex* is to be found in any Isle-of-Wight garden at the present day; if this be not its origin with us it must have been long naturalized, though unobserved in the locality just given. Amongst the figures of old authors, that of Gerarde (Johnston's ed.), p. 325, fig. 1 (White Orache), is the best and most characteristic of the species as it presents itself with us, except that the leaves are here very obtuse. The plant is easily recognized when not in fruit, by the great size of its leaves, which somewhat resemble those of beet in their fleshy, oleraceous character, and those of spinach in form, but are much larger, the lowermost being often as long and wide as the expanded hand or bigger. The fructiferous valves or perigones of the pistillate flowers are very conspicuous from their great dimensions, and are broadly ovate or nearly orbicular, slightly pointed and mucronulate, quite entire and destitute of tubercles or crystalline granulations. They are besides of a thin, membranous texture, particularly when fully ripe, at which time they are elegantly reticulated with prominent veins, and bear a considerable resemblance to the enlarged perianth of a dock. The perigones are quite free to the very base, and distinct, or not imbedded in fleshy tissue, subpedicellate, closely applied to one another by their flat margins to their apex and enclosing a large vertical seed of a greyish black or oftener yellowish colour, orbicular, much compressed, covered with a pale, close-wrinkled skin, sessile at the base of the perigones and quite unconnected with either of them. Amongst these pistillate flowers are interspersed others that are hermaphrodite, on very short but distinct pedicels, and bearing each a blackish and coated seed like the rest, but smaller and horizontal, partially enclosed by the five connivent perianth-segments, and in all respects resembling the same parts in *Chenopodium*. "Strange is it," exclaims Linnæus, when speaking of the genus in his charming work

the 'Flora Lapponica,* "that if you abstract the female flowers the plant will be no longer an *Atriplex* but exactly a *Chenopodium*." A remark, which, by the way, is not so strictly applicable to many species of *Atriplex* as the one now before us.

I have a perfect recollection of gathering a specimen of our *Atriplex* on an old compost heap at Sandown, several years ago, and being considerably puzzled at the time what to make of it, as the plant was only just beginning to form flower-spikes. I judged it might be a very luxuriant example of *Chenopodium hybridum*, with which I was then practically unacquainted, or a monstrously overgrown root of spinach. I have now no doubt of what was its real nature, since I have met with it a second time in a state for determination, and in a much more satisfactory locality. I have been thus led into detail, because I believe this old denizen of the kitchen-garden is become extremely rare and known but to few; that it is probably no longer cultivated by any but the curious botanist, but that it occasionally maintains its ground in this as in other parts of Europe, where, from its general family resemblance to the rest of this too much neglected and perhaps uninviting tribe, it is passed by or confounded with its congeners.

Since writing the above, I have been informed by an intelligent young gardener, whose name has already appeared in the pages of this Journal, Mr. Thomas Meehan, that *Atriplex hortensis* frequently appears as a weed in and about St. Clare, near this town, but is not cultivated there.

WILLIAM ARNOLD BROMFIELD.

Ryde, Isle of Wight,
September 25, 1845.

On the Polygonum mite of Schrank, and allied species.

By HEWETT C. WATSON, Esq., F.L.S.

THREE additional species of *Polygonum* have been lately enumerated in the descriptive Floras of Britain, which were either omitted altogether in preceding works, or noticed only as varieties of other better known species. They appear in the 'British Flora,' fifth edition, under the names of *Roberti*, *mite* and *laxum*. Having been

* Fl. Lapp., p. 303.

kindly supplied with seeds of *P. Roberti* (*P. Raii*, *Bab.*), by the Rev. W. S. Hore, I hope next year to ascertain whether it will remain permanently distinct from *P. maritimum*, when grown under the same conditions of soil and temperature. Though *P. maritimum* assumes very much the general appearance of *P. Roberti*, when grown in my garden, it has now retained, through three descents, the strongly-nerved ochreæ which Mr. Babington deems the best character for distinction from his *P. Raii*.

Polygonum mite has been something of a puzzle to me until this present autumn; and finding other (and better) botanists at fault in distinguishing this species from its allies, I trust that some remarks on its character and synonyms may not be mistimed, particularly as I have just been drying a supply of *P. mite* for the *distributing* Botanical Society.

In the following dichotomous sort of arrangement of their characters, the native species of the group are contrasted against each other in such a way as to show both their resemblances and differences; and if printed as written, it may afford a sufficient diagnosis for each of them.

I. Fruit triangular, or compressed, with convex faces, one face usually rising into a third angle at the base. Peduncles nearly or quite glabrous. Ochreæ fringed.

- A. Fruit shining. Spikes erect. Ochreæ strigose.
 - a. Styles connected half their length. Fruit large, with broadly ovate faces.
 - 1. Spikes oblong, dense, usually leafless, (*Persicaria*).
 - 2. Spikes filiform, interrupted and leafy below, (*mite*).
 - b. Styles connected two-thirds of their length. Fruit small, narrowly ovate.
 - 3. Spikes filiform, (*minus*).
- B. Fruit opaque. Spikes drooping. Ochreæ subglabrous.
 - c. Styles distinct almost from their base. Fruit large ovate.
 - 4. Spikes filiform, interrupted and leafy below, (*Hydropiper*).

II. Fruit compressed, with concave faces. Peduncles glandular-hispid. Ochreæ slightly or only partially fringed.

- C. Fruit shining. Spikes erect. Ochreæ subglabrous.
 - d. Styles distinct almost from their base. Fruit rather large, roundish ovate.
 - 5. Spikes oblong, dense. Lower ochreæ without fringe, (*lapathifolium*).
 - 6. "Spikes elongated slender." "Ochreæ shortly fringed," (*laxum*).

Polygonum mite is usually contrasted against the *Hydropiper* or *minus*; and as it is sometimes confused with one or the other of them by good botanists, that course would seem to be necessary. According to my own view, it is much more closely allied to *Persicaria* than to either of those two species; and, indeed, I can separate it from *Persicaria* by no other good mark besides the difference of inflorescence, which is slight enough in some examples.

It may be that I am not sufficiently familiar with *P. laxum*. If understood, I take it to be simply a variety of *lapathifolium*. Taken together, these two are readily distinguished from the rest by the hollow surfaces of their fruit. *Persicaria* and *mite* are recognized by their larger flowers, which are opaquely milk-white when expanded, though the perianth is usually coloured on the outside. Their fruit distinguishes them from the two former, by its angularity or convexity, from *minus*, by its greater size; from *Hydropiper*, by its shining surface. The flowers and fruit of *minus* are scarce half so large as those of the other species. The drooping inflorescence, glandular perianths, and opaque fruit amply distinguish *P. Hydropiper*, which is also further distinguishable from *mite* by the narrower segments of the perianth, and their more transparent or watery-white tint internally. The real difficulty comes when *Persicaria* and *mite* have to be distinguished from each other, since we have only the difference of broad and slender spikes for contrast here, and some examples of *mite* come rather inconveniently near to *Persicaria*.

In respect to some other characters which have been used for specific diagnosis, it may be said that they are too variable for reliance apart from the fruit and inflorescence. Thus, the ochreæ of *mite* are sometimes almost glabrous, and those of *Hydropiper* are occasionally strigose. The fringe of the same organ, formed by the excurrent nerves, is absent in some of the upper ochreæ of *Hydropiper*, and occasionally present in some of the lower ochreæ of *lapathifolium*. I have seen both glabrous and hispid peduncles on the same plant of *Persicaria*. The rounded or attenuated bases of the leaves are inconstant characters. And the stems of all these species (unless *P. laxum* be an exception), vary from simple to much branched, from erect to decumbent and rooting at the lower joints. On the whole, the fruit and inflorescence offer the best characters for specific diagnosis.

I have not had the opportunity of seeing the figure and description of *P. mite*, in the 'Supplement to English Botany.' Here I possess only the small edition of that work, and I do not find *P. mite* among

the supplementary plates sent with that edition. The volume which should include the figure, has been lost from the Linnean Society, where there appears no haste to replace it. The character and synonyms of this plant are correctly given in the fifth edition of the 'British Flora,' except that the spikes are said to be "drooping," which I do not find to be the case. The description in Babington's Manual is also correct, or nearly so. As in allied species, the stamens vary in number; but I think that six (not five) is the usual number; one close on each side the ovary, and four others in an outer whorl. The "spikes thickening upwards" I do not quite understand.

I have collected *P. mite* along the gravelly margin of the Thames, Surrey side, between Walton bridge and Sunbury lock; more especially near the bridge, where Lord Tankerville's lawn runs alongside the river. It occurs also in a ditch, at the entrance of the first (short) lane on the right hand, in passing along the road from Hampton Court bridge towards the South-western Railway. I have likewise a fragment, apparently of the same species, though in a young state, from the neighbourhood of Southampton. Cheshire specimens are in the herbarium of Sir W. J. Hooker, sent by Mr. W. Wilson, under the name of *P. minus*, (1828). I have also European specimens of the same species, sent with the names of *laxiflorum* (Weihe), *dubium* (Braun), *Braunii* (Bluff and Fing.), and *mite* (Pers.). With the exception of the last, these names may be taken for synonyms of our English *P. mite* (Schränk). Persoon apparently intended the American species, which is not the same as the European one (previously?) named "*mite*" by Schränk. It is difficult to say whether Allioni's figure and description of *P. strictum* belong to *mite* or *minus*. Bertoloni, with specimens from Piedmont before him, refers them to *P. minus* of 'English Botany.'

It should be mentioned that a specimen of the Walton-bridge plant was last year communicated to an eminent English botanist, whom I supposed to be well acquainted with *P. mite* of the 'British Flora' and 'Manual of British Botany.' He referred my plant to *P. minus*, considering it to be the form which Fries has called *P. strictum*, and with which he unites our *P. minus* as a smaller variety. After re-examining the Walton plant this year, together with *Persicaria* and *minus*, all in a fresh state, I find myself unable to concur with the botanical friend alluded to. I refer my plant unhesitatingly to the species received as *P. laxiflorum*, from botanists of Prussia and

Austria. Of its distinctness from *Persicaria*, there seems much more reason to doubt, although my series of specimens are not yet sufficient to connect the two presumed species.

HEWETT C. WATSON.

Thames Ditton, September 30, 1845.

On the prevalence of European Genera and Species of Plants in the hilly parts of the province of South Australia. By THOMAS CORDER, Esq., A.L.S.

THE settled part of the above province is pretty much confined to the district between the Gulf of St. Vincent and the river Murray, and is divided into two parts by a range of hills of considerable elevation. Running north and south between these hills and the sea, the country is principally a level plain, lightly timbered with various species of *Eucalyptus*, *Callitris*, *Banksia*, *Casuarina*, *Exocarpus* and *Acacia*, which list comprises nearly all the trees in the colony. The vegetation is of a very exotic character, but in the vicinity of Adelaide I have noticed *Poa annua* and *Polygonum aviculare* in great profusion by the sides of foot-paths and roads.

The country beyond the hills is table-land, elevated about 1200 feet, and sloping gradually towards the Murray and lake Alexandrina. It is diversified with forest ranges and open grassy valleys, and watered by numerous small streams, which, however, cease to flow in the dry season. The vegetation in this district bears great affinity to that of Europe, with the exception of the trees, which are pretty much the same as described above. The most common grass is the kangaroo grass (*Anthisteria australis*), but *Poa trivialis* and *annua*, *Festuca*, *Bromus*, *Avena*, *Briza*, *Agrostis* and several others are frequently met with. The brooks and streams abound with the common reed (*Arundo Phragmitis*), *Typha angustifolia*, *Glyceria fluitans*, *Lycopus europæus*; and the swampy ground produces the marsh mallow (*Althæa officinalis*). The only Australian *Rubus* (*R. australis*) grows in similar situations; the fruit resembles the raspberry, but is very rarely produced. The pastures are covered in spring with a *Ranunculus* closely resembling *R. bulbosus*, but with tuberous roots, and two species of *Viola*. I have also gathered *Matricaria Chamomilla*, *Melilotus officinalis*, *Centaurea solstitialis*, *Lotus corniculatus* (in very

great profusion), a flax, which I could not distinguish from *Linum perenne*, a *Medicago*, closely resembling *M. maculata*, two species of *Convolvulus*, exactly resembling *C. sepium* and *C. arvensis*, a *Geranium*, with the habit of *G. dissectum*, but with very large bulbous roots, *Stellaria graminea*, *Polygonum Persicaria*, and several others. But this vegetation is entirely confined to the open grassy country; the Flora of the forest ranges being entirely of an exotic character, abounding particularly in orchidaceous plants, most of which I believe to be nondescript. These flower in the early spring, with the exception of a *Neottia*, which takes the place of *N. spiralis*, and is nearly similar, but larger, and with very fragrant pink flowers.

As I was one of the first settlers in that district, I feel fully assured that the species I have enumerated were not introduced, the land being then entirely in a state of nature.

THOMAS CORDER.

Writtle, September, 1845.

On the identity of Avena sativa with A. fatua, being the result of observations during a residence of five years in the province of South Australia. By THOMAS CORDER, Esq., A.L.S.

On my first settling in the above colony, I found it to be a general belief amongst farmers, that the common oat was apt to degenerate if sown several years in succession on the same soil; and was also informed that the farmers in Van Diemen's Land were in the habit of renewing their seed from England every year. This led me to inquire into the subject, and I will now proceed to give the result of my observations. In August, 1842, I procured some seed oats of excellent quality, weighing about 42lbs. per bushel, which had been grown two seasons in the province: these I sowed on three acres of new ground which had never before been cropped. In January, 1843, my crop was ripe, but the quality of the grain was inferior to that sown, and a portion of the plants began to assume the appearance of *Avena fatua*. The oat, though still white, was somewhat hairy at the extremity, and in some cases was awned. The summer being hot, a large quantity dropped out in cutting, so that I allowed it to remain as a self-sown crop, without ploughing, and in January, 1844, I had a second crop ripe, about equal in quantity to the first, but by this time a portion had changed entirely to *fatua*, and a very small part of the remainder

preserved its original character. I allowed it to remain a third season, and when I left the colony in the beginning of the present year, about two thirds had become fatua, and nearly all the rest was in the intermediate stages. The soil was rather poor and stony, but I found the transformation to take place much more rapidly in a deep, rich soil. I examined a field of that description which had been self-sown two years in succession, and was not able to find a single plant which retained any appearance of the original, in a very dense crop on about twenty acres of land, which was consequently cut green for hay, a very common custom in the Australian colonies and also at the Cape. I could multiply instances, if necessary, to prove this remarkable and interesting fact, which shows the origin of one of the cereal plants, if what I have already mentioned (which would be confirmed by any practical farmer in the colonies) were not sufficient to prove what I have asserted.

The variety called the Tartarian oat is, I think, distinct, as I found it to remain unchanged for several years on the same soil, but I am not aware that it has ever been found in a wild state. Perhaps it might be referred to *A. strigosa*?

THOMAS CORDER.

Writtle, September, 1845.

Occurrence of Alyssum calycinum and Narcissus biflorus near Dawlish. By R. C. R. JORDAN, Esq.

YOUR correspondent, the Rev. Gerard Smith, in a paper in the 'Phytologist' (Phytol. ii. 282) on the claims of *Alyssum calycinum* to be regarded as a native, says that all the localities hitherto recorded in England lie near the eastern coast; it will therefore be interesting, at least to him, to know that my brother found it near Dawlish, occurring rather plentifully in a sandy *ploughed* field. It may be well to add, that although we must have often passed through the field, even in the time of its flowering (May), we never noticed it before this year.

Narcissus biflorus.—This plant occurs in small clumps of two or three, scattered here and there, over the whole of the Dawlish warren. It does not seem probable that in such a situation it could be merely an exile from a garden; and its being nowhere abundant and yet found on opposite parts (in some places where the turf seems not to

have been disturbed for many years), seem to prove that it has either been planted there by the hand of Nature, or else by that of some botanist who has thought fit to help her in her operations. The first plant that I saw there I procured, thinking (as it was not yet in flower) that it might possibly prove to be *N. poeticus*. I was, however, disappointed, but yet it in some measure repaid me to find an old friend in so unexpected a locality. Orchards near farm-houses often produce it abundantly, when its white flowers, intermixed with those of *N. Pseudo-narcissus*, have really a most brilliant appearance.

ROBERT C. R. JORDAN.

Teignmouth, September 19, 1845.

*Remarks upon the Potato-murrain.** By H. O. STEPHENS, Esq.

THE destruction of so large a portion of the potato crop is a calamity of such magnitude, that it would necessarily occupy the attention of this Society; but when it is supposed this destruction is effected through the agency of a minute cryptogamic plant, the interest of the inquiry is greatly increased, and the whole matter falls at once within that department of Natural History for the cultivation of which the Botanical Society of London was formed.

Your Hon. Secretary has requested me to draw up a few remarks on the potato-murrain, as it has been called, and it is only my desire to be useful to the Society that emboldens me to forward these remarks, which are very imperfect, being hastily put together amidst all manner of interruptions. They must be regarded as sketches towards a history of the disease, rather than as a complete description of the phenomena in all their aspects.

It will perhaps be better to enumerate the symptoms in succession, commencing with the external and internal physical characters of the disease, and then endeavour to ascertain if the immediate cause of the decay of the foliage and tubers can be detected.

The potato crop, at least in the district in which I reside, was, up to a certain period, one of unusual promise, but it was generally observed that the haulm was excessively luxuriant, and this rankness of growth was attributed with justice to the excessive moisture of the summer. Suddenly the leaves began to shrivel and roll backwards,

* Read before the Botanical Society of London, 3rd October, 1845.

and turn black, and the same kind of black patches appeared on the stem, and a field of potatoes smitten by the disease, presented much the same aspect as if the haulm had been destroyed by the sharp frost of an autumnal night. And so alike was the appearance, that many were deceived by it, and thought their crops were killed by the frost. In a very few days from the appearance of the disease the haulm decayed down to the ground. The tubers of the blackened plants shared in the sudden destruction, their surface became discoloured, and of a livid leaden hue, and the rind presented a rugose or pustulated appearance, but the same root bore tubers both sound and unsound, and in all states of disease. I did not notice that the perfection of the tuber at all interfered with the progress of the disease, because fully grown and immature tubers were equally infected on the same root, nor could I at all ascertain, as some have asserted, that the tubers nearest the surface of the ground were first attacked.

When an infected tuber is cut across, the circumference is discoloured, and turned brown beneath the rind; the external portion of the potato being the part first affected. The brown spots seem drier than the rest of the structure, and the whole much resembles the brown discolouration beneath the skin of a bruised apple. It is pretty generally stated that the tubers soon pass into a state of complete decay, a moist rottenness, but this is, I think, an accidental circumstance, for if kept in a dry place, they desiccate and shrivel, at least such is the case with my specimens. In a state of moist decay they exhale a most unpleasant odour. Only a portion of a tuber is sometimes diseased, and the eyes of the sound portion germinate as usual; and if a part of the potato is above ground and exposed to light, chlorophylle is formed in the tissues. When cooked, the appearance of the unsound potato is very disgusting. All the portions which were brown when raw, when boiled turn of an ashen livid hue, and the substance of the whole is waxy and the odour and taste very unpleasant. There can be no doubt that these potatoes are totally unfit for human food, and that eating such would be dangerous, it being too well known that decayed or decomposing vegetable or animal substances, when eaten, produce severe diseases.

A microscopical examination of a portion of a diseased potato exhibits the following conditions. That portion, usually the centre, which is still tolerably sound, contains the starch corpuscles in an unaltered state, whilst the circumference of the tuber, which is usually discoloured and unsound, will be found nearly exhausted of starch. The starch corpuscles disappear, or are absorbed or disintegrated in

the diseased portions, and the cells which before contained the fecula are either empty or contain brownish crystalline bodies, which are, I suppose, the remains of the decomposed starch globules. The potato, then, is deprived of its natural principle by this disease, in a manner analogous to the process of germination, in which the starch entirely disappears.

It is quite certain that the present potato-death is entirely a new plague, as far, at least, as England is concerned; it is true that some years ago the potato crop was injured by what was called the *curl*, in which the leaves curled or shrivelled up; but we have no accurate account of this affection, but it was altogether different from the present visitation.

What, then, is the immediate cause of the destruction of the potato crop throughout Europe, for all botanists agree in the identity of the disease? It can only be ascribed, with any degree of probability, to one of two causes, either to atmospheric influences, or to the immediate agency of some destroying principle acting directly upon the plants. The latter seems to be most generally received as nearest to truth, and for this reason, that the leaves and stem, and the exterior of the tubers are found to be infested with a mucous fungus, whilst it is likewise stated, on the highest and best authority, that a singular mycetoid production inhabits the intercellular spaces in the diseased tubers.

I will merely relate the result of my own investigations, leaving it to the Society to receive them or reject them according to their own standard of evidence. I, like all other observers, notice that the leaves in most specimens sent for examination, present a hoariness of aspect, and this hoariness is caused by countless plants of a species of the genus *Botrytis*, in which I find the stem branches into three divisions. This is the *Botrytis infestans*, and Mr. Berkeley states in the 'Gardener's Chronicle,' he finds this fungus invariably *preceding* the work of destruction. I likewise find on the black patches of the stem, another excessively minute fungus, which appears to belong to the genus *Fusisporium* of Link. It consists of innumerable, excessively minute, elliptic sporidia, collected together in heaps. They exist in countless multitudes, so that the field of the microscope is covered by them. It is utterly impossible to confound these with the sporidia of the *Botrytis*. These mycetoid plants inhabit the stem, leaves and exterior of the tubers; there is still a most singular mucous fungus, which is described both by Montagne and the Rev. Mr. Berkeley as spreading its mycelia through the intercellular spaces of the tuber itself. Mr.

Berkeley states in the 'Gardener's Chronicle,' this parasite was discovered by Dr Kayer on potatoes during, or immediately after, the process of germination. Dr. Montagne, of Lisle, considers this as a new genus between, or allied to, *Sepedonium* and *Asterophora*, two genera of fungi which are parasitic within or upon other fungi, *e. g.* *Agarics* and *Boleti*; it is said to be furnished with bristly spores, whilst those of *Sepedonium* are echinulate, and those of *Asterophora*, as the name implies, star-shaped. Dr. Montagne proposes to name this parasite *Arlotrogus hydnosporus*.

I have carefully examined many samples of unsound potatoes, and have not succeeded in detecting this fungus. There can be no doubt of its existence; such observers as the Rev. Mr. Berkeley and D. Montagne cannot be mistaken; but the question which suggests itself to my mind is this,—Is the *Arlotrogus hydnosporus* *invariably* present in the diseased potato? I think I scarcely should have failed to detect it if it was. I have been shown what some supposed to be spores of fungi in the intercellular spaces, but these turned out to be the crystalline brownish bodies before noticed, which I conclude to be the remains of the decomposed starch corpuscles.

Mr. Berkeley states he finds the spawn very evident in the diseased cells when there was no external symptom of the presence of mould. This, then, was the spawn of the *Botrytis infestans*, and not of the *Arlotrogus*. Admitting the destruction to be caused by the immediate agency of mucose fungi, which is the destructive parasite? — the *Fusisporium Solani*, to which many continental botanists attribute the death of the stem and leaves; the *Arlotrogus hydnosporus* of Montagne, which spreads its mycelia through the intercellular spaces of the substance of the tubers; or the *Botrytis infestans*, the spawn of which Mr. Berkeley has abundantly detected in the cells of the tubers likewise, and as I am informed by a friend, bursting through the stomata of the leaves, just as *Cylindrospora major* is figured issuing from the stomata of *Tussilago Petasites* by Nees and Henry, 'System der Pibse. tab. i. fig. 2.' It is considered unphilosophical to ascribe one effect to the operation of several causes, when one would suffice for its explanation, and I suppose the potato-murrain will scarcely be attributed to the combined operation of these fungi. Mr. Berkeley says he is convinced the spots upon the tubers arise from the attack of the mould, and that the mould (*Botrytis*) is not an after organization. No opinion advanced by this accurate observer and profound Mycologist can be lightly controverted, but other writers attribute the destruction to other fungi, which beyond all doubt certainly exist in

some tubers. It may be thought this is an inquiry into the operation of immediate causes, which, although very curious, is of no practical importance, but this is an error : it is a question of vast amount. If this disease is really produced by germs of endophytal fungi, nestling within the structure of the parent ; many of these germs will remain in a latent condition within the cellular structure of the potato, and when such an apparently sound but really infected tuber is used for planting in the ensuing year, they will be called into activity again during the process of germination of the potato-set, and the same disease will probably appear in the potato crop next autumn ; whereas, if the present murrain be only the effect of an unusually cold and wet season, it may reasonably be hoped a more congenial summer will rid us of the calamity. At all events, it will be highly desirable that in the next planting-season the farmer should select his sets, not only from sound tubers, but if possible from seed plants obtained from localities in which the disease did not appear.

I do not venture to speak dogmatically on the exciting cause of the murrain, especially when so many excellent observers maintain a contrary opinion, but I am not perfectly satisfied these fungi are really more than accidental accompaniments, rather than the essence, as it were, of the malady. I cannot divest my mind of the impression, that with more probability it may be referred to atmospheric influences, that is, to the direct debilitating operation of a prolonged low temperature, combined with excessive moisture, upon the structure of the plant. The potato plants, as I have before observed, exhibited an unusual rankness of growth during the summer, when their structures, doubtless, were over-filled with watery sap, just that state of the vegetable constitution which renders their vitality low, and therefore less able to resist the debilitating effects of cold. They therefore in many situations perished by what I shall denominate vegetable sphacelus. Without speaking confidently, I merely state I am at present rather inclined to take this view of the subject, which is borne out by many analogies in the animal economy. It is a singular fact, if true, that where the potato crop is exposed to the stimulating atmosphere of the sea, *e. g.* the coast of Devon and Somerset, the murrain is said not to have appeared. Perhaps the sea-breeze, loaded with salt impregnation, may operate as a tonic or stimulant to the foliage of the potato-plants, and thus preserve them from the tendency to decay. The whole of Europe in which the potato-murrain rages, has suffered from the same ungenial wet and cold summer which has afflicted England ; therefore the same explanation may be

applied to all those countries. But, on the other hand, it must be stated that the cryptogamic parasites are identical in all countries and situations.

If newspaper reports may be relied on, it is stated that the same disease destroyed the crops in New Brunswick and some parts of Canada last year. Admitting this statement to be correct, much light would be thrown on the question of the exciting cause of the murrain, if it was ascertained if the season last year, in those provinces, was fine, or cold and wet, like the present summer in Europe. If it turns out that the summer of last year in those parts of America was dry and genial, of course the opinion I have expressed will be scarcely tenable, and that explanation which attributes the disease to the destructive ravages of fungi must, I presume, be accepted.

So much has been written upon the best method of turning the diseased potatoes to account, that I need not refer to the subject at any length. I find that up to this day, all my specimens of diseased tubers which are kept in a dry place, remain *in statu quo*, and do not pass into moist decay. I therefore strongly recommend, as many other writers have done, that they should be washed clean as soon as dug up, and immediately dried, either in a kiln or in a room with a large fire in it. Those which are very bad should at once be crushed, and the flour extracted, and the remainder, if kept perfectly dry, would keep during the winter, and might be used, when boiled with a little salt, as food for pigs, &c. I have no doubt this will be found in the long run more profitable to the farmer than making flour from them, which will not prove a very acceptable article of diet, and if not carefully separated from all the diseased matter during the process of manufacture, will likewise, I am afraid, not be very wholesome.

HENRY OXLEY STEPHENS.

78, Old Michael Street, Bristol,
October 2, 1845.

[At page 111 of the 'Transactions of the Microscopical Society' will be found a paper by Mr. Hassall, entitled, "An explanation of the cause of the rapid Decay of many Fruits," in which the *agent of decay* is shown to be a minute fungus. In connexion with the present engrossing subject of the failure of the potato crop, and apparently from a similar cause, Mr. Hassall's observations will be found highly interesting.—*E. Newman.*]

Notes of a Botanical Ramble in Connemara and Arran.

By LESLIE OGILBY, Esq.*

You have urged me to give some account of my late excursion to Connemara and Arran. You are pleased to think it would be botanically interesting, and even acceptable to the editor of the 'Phytologist.' In responding to your wish, it is not without the greatest diffidence, both as to my ability for the attempt, but also as to the quality of the material I have to communicate.

I shall commence my ramble from the historically interesting town of Galway. Mounted on a comfortable Bianconi car, I left the town on the 15th of August, about 10 o'clock in the morning. The car runs to Clifden, on the western coast, at which place it arrives at 7 in the evening. The scenery between Galway and Oughterard is very pleasing: you have, for nearly the whole way, views of the great Lough or Lake Corrib, and along the road there appears a good deal of young plantation, an evidence of means, taste, and consequent improvement. The very neat little town of Oughterard is the first place of any note you come to; the situation is very pleasing, and seems to occupy, as it were, the boundary between the primitive mountains of Connemara and the secondary range forming the lowlands. A very handsome river runs through part of the town, opposite O'Flaherty's Hotel, and a branch of Lough Corrib approaches it on the eastern side. In this immense sheet of water are many islands. The whole neighbourhood, indeed, affords a field for the general naturalist. In the rivers the *Mya Margaritifera* abounds; and I learned from two eminent conchologists whom I met at Roundstone, that some good pearls are occasionally offered for sale in the town. I have often heard the late talented Mr. James White, for so many years undergardener at Glasnevin, speak of this place. He accompanied the then Professor of Botany, Dr. Wade, in his botanic journey to Connemara, some thirty or forty years ago, and they made Oughterard a kind of head-quarters. On one of the islands of Lough Corrib I perfectly recollect Mr. White informing me he found *Potentilla fruticosa*, and on a visit he made to the large island of Boffin, off the western coast, he found that beautiful variety (if such it be) of *Convolvulus sepium*, with the corolla pink coloured, so very like *Convolvulus Soldanella*. He long cherished this plant in the Glasnevin Garden as a

* Addressed to D. Moore, Esq., of the Dublin Glasnevin Garden, by whom it is communicated.

special favourite. You are aware I was fortunate enough to find, two years ago, a similar plant in the neighbourhood of Newcastle Bearhaven, and you have mentioned to me your having found a like plant in the island of Rathlin, off the north coast of Antrim. It was from this excursion to Connemara that Dr. Wade brought his three little treasures, as he called them, viz.: *Phleum alpinum*, *Agrostis minima* and *Juncus filiformis*. The car stops for dinner at Flynn's Inn, or the half-way-house, a hospitable and comfortable country cottage, well known to visitors to this western region. The distance between Oughterard and Flynn's is but ten miles, and this, as well as the other stages to Clifden, the ardent botanist should by all means walk. On leaving the former place he at once gets into the wild region of mountain, lake and bog. At some distance he will have the mountains with him on each side, as also those small lakes so prominent a feature in this western district, and some one or other of which he never loses sight of until he reaches Clifden. In most of these lakes he will find the delicate *Lobelia Dortmanna*, accompanied by that rare plant to England and Scotland, *Eriocaulon septangulare*, appearing, as some writer fancifully observes, like a West Indian beauty, with her negro slave. His attention will also be drawn, as he passes along, to the pride of Connemara, the beautiful *Menziesia polifolia*, a plant first made known to the botanical world by the illustrious naturalist Ray, upwards of a hundred years ago. He will also see in abundance the *Osunda regalis*, or royal fern. I stopped a day at Flynn's, and made a long march through the mountains north of the inn, with but little success. By the banks of a mountain stream I found *Orobis sylvaticus*, a rare Irish plant. In the neighbourhood of Flynn's you find the *Menziesia* in great perfection. Here, too, you get splendid specimens of *Drosera*, particularly of *D. longifolia*, I never before saw such large plants. *Pinguicula vulgaris* and *lusitanica* are quite common, and the elegant little *Anagallis tenella* is to be found running at the bottom of every ditch-bank. In all the surrounding bogs *Rhynchospora alba* grows in profusion, the white and level heads of which give, in some measure, a relief to the dark, monotonous colour of the peat. Leaving Flynn's, I came to Adams's Inn by the car. This snug little place is about fourteen miles from Flynn's and five from Clifden. The cottage, for such it is, is an important place to the lovers of the angle, being but a short distance from the far-famed lake and river of Ballynahinch, situated too, as it were, under the magnificent group of mountains, called the Twelve Pins of Ballabola, it affords the best opportunity of exploring the recesses of these impos-

ing masses, as also of seeing the charming lakes of Derriclare and Ina running into the very bosom of the mountains. Behind the inn is a road leading to the green marble or serpentine quarries. At Adams's I hired a car to take me to Roundstone. Mr. Martin, of Ballynahinch grants the privilege of passing through his grounds, and the distance by this route is six miles. After passing Ballynahinch and getting to the river side, I was so captivated by the beauty of the place that I sent on my car and determined to walk. The banks of the river were bounded here and there by rocky knolls, now garnished with the autumnal furze (*Ulex nana*), *Erica cinerea*, *Calluna vulgaris* and *Menziesia polifolia*, the tall, elegant spikes of this last overtopping the rest; altogether they formed a blaze of bloom. You know my partiality for the heath tribe, and can appreciate my feelings on the occasion. I never saw a more beautiful sight; I dwelt upon it with delight, and felt as if I could never sufficiently admire it.

"Tam thought his very een enriched."

A unique object here presents itself, so singular as to attract every passer by. A mass of rock, some ten or twelve feet in height, rises in the middle of the stream, encircled near its top by a wreath of *Polypodium vulgare* growing in the utmost luxuriance. On leaving the river bank, the rest of my walk was by no means so attractive. When within a short mile of Roundstone, however, and close by the little hamlet of Letterdife, my eye at once detected a plant or two of *Erica Mackaiana* in the ditch-bank bordering the road-side. Returning to reconnoitre the place, I found on the other side of the ditch many plants of this very dubious species. This I consider an interesting discovery, being a new locality for the plant, distant from the original habitat at least two miles. Near this same place I also found the very diminutive moss-like form of *Calluna vulgaris*, similar in every respect to a specimen found by me in Donegal last year. I found the inn in Roundstone, kept by M'Auley, clean and comfortable, and the landlord and his wife so very attentive, that I was induced to make a considerable stay in the place, and was so fortunate as to have as an associate a most agreeable and intelligent English gentleman and zealous conchologist. I did not fail to make a visit to Glan Iskey, a valley imbosomed in the beautiful mountain of Urrisbeg, and the home, "Sweet home," of the Mediterranean heath, or rather the Irish representative of that plant. What a peculiarly interesting sight does this lonely valley present,—can any spot be

more worthy of a botanical pilgrimage? A stream rises in and takes its course through the valley, spreading and ramifying to some distance on either side, and along this stream the heath runs for a mile or so; it grows in tufts, and you step from one of these to the other, and I remarked that the plant never leaves the influence of the water. Glan Iskey is accessible without any difficulty, and nothing can be more appropriate than its Irish appellation, the watery glen or valley. I also paid more than one visit to Craigga More (the large rough hill), a most conspicuous hill on the new road to Clifden. This is the first described habitat of the *Erica Mackaiana*, and here, indeed, it grows in profusion along the road-side, appearing at this time, 23rd August, in all its perfection and loveliness. As I have much to detail to you respecting this singular plant, I shall defer saying more respecting it to another time. It was on one of my trips to this locality that I found *Rhynchospora fusca*, and *Peplis Portula*, and found every boggy ditch green, or rather bronzed, with the *Utricularia minor*. Looking from the hill of Craigga More, on the one hand towards Urrisbeg mountain, and on the other in the direction of the Twelve Pins, there appears a perfect maze of lakes; what a field for the young and enterprising botanist! At some of these small lakes I saw several men employed raking out the white water-lily, the roots of which they use as a dye in some of their simple, home-wrought manufactures. East of Roundstone, at about half-a-mile distant, between the old road to Clifden and the sea, are some interesting little lakes. They are like bowls, appearing sunk beneath small rocky hills. These small lakes abound with the *Eriocaulon*, *Lobelia Dortmanna* being comparatively rare. On these small rocky hills I picked some beautifully coloured varieties of the *Menziesia*. On crossing over the bay of Roundstone to the long, straggling island of Innisnee, lying opposite the town, and dividing Roundstone bay from that splendid expanse of water, called Birterbuy bay, I found during my ramble a splendid plant of the white variety of the *Menziesia*. This was the first time during all my wanderings in this country that I ever found this variety. In an old church-yard on the island I found *Inula Helenium* or elecampane, and as I never but once before found the plant, and then in a kindred situation (Whaley Abbey, in the county Wicklow), I am led to suppose it in former times connected with religious feeling or observance.

On the 3rd of September I left Roundstone for the island of Arran (Arran More), about twenty miles distant, accompanied by my friend, Mr. B. We left at 11 o'clock in the morning, but being beset with a

calm, we did not arrive at our destination until nightfall. Fortunately the little inn at Kilronan (the principal place in the island), was close to the shore, so that we soon established ourselves and baggage in Mrs. Costello's best parlour. I shall never forget my surprise next morning on a view of the place. I had imagined the island a most fertile spot, clothed with verdure, but to my astonishment it appeared a rude mass of limestone, the whole surface, wherever you went, scattered over with loose fragments of the same material. A short acquaintance with the place shows you its remarkable character and peculiarities. A long strip of land, running nearly east and west, ten miles in length and perhaps not more than from three to four in breadth. This form gives it a large sea-board, and with a surface rising gradually and in a curved form from its northern shore, it attains a considerable elevation or ridge, and then falls abruptly on the other side in perpendicular cliffs. From this peculiarity of form the surface of the island in its whole length is thrown up so as to have a northern aspect, or nearly such. The climate must be a very peculiar one, exceedingly moist and mild. The arable ground is indeed very small in proportion to the mass of rock, but it must be of a peculiarly nutritious and fattening quality, for the place is noted all over Galway for producing the largest and finest calves. There is a peculiarity of the place, but artificial, that strikes a stranger. The whole island is parcelled off into small enclosures by loose stone walls, which appear a serious obstacle to progression. With an attendant or guide, however, these walls fall like magic before you: he goes before, and without any ceremony pushes down so much of the frail structure as to leave a breach for you to pass. In numerous instances, generally on the higher parts of the island, you meet immense boulders of conglomerate; these are erratic blocks, and evidently quite foreign to the place. I walked to the buildings called the Seven Churches, which I found insignificant as to size, and totally devoid of ornament; and also visited two out of the four of those very remarkable circular stone forts as they are called, and which structures, from their size, form a feature in the scenery of the place.

I shall now give the result of my botanical research on the island. *Adiantum Capillus-Veneris*. This charming rarity is to be found in abundance, and grows generally over the island wherever there are fissures or clefts in the rock. The usual depth it grows at is from eighteen inches to two feet, keeping just so much below the surface as to shelter its delicate fronds from the blast. There is a great deal of the plant heedlessly destroyed. The inhabitants use it in decoc-

tion in cases of bad colds and complaints of the lungs, and for this purpose, instead of merely cutting the fronds, they pull it up root and branch. I looked in vain for the variety or species with the annulate pinnules said to have been found here.

Neottia spiralis. Diffused over the whole island. I could have gathered hundreds of plants.

Helianthemum canum. I was most fortunate in this discovery, adding by it a new and interesting plant to the Irish Flora. It is abundant, growing in small tufts in the interstices of the rock. Its season of flowering was past. I found but two single flowers.

Euonymus europæus. In the clefts, but stunted.

Arenaria verna. In several instances.

Carduus nutans. In a particular spot near the town.

Crithmum maritimum. Rocks, Kilronan bay.

Juniperus communis. Common in the fissures of the rock ; always dwarfed.

Prunus insititia. Found in the rocky clefts : in fruit.

Marrubium vulgare. Common, mostly near the villages or hamlets.

Thymus Calamintha. In such profusion on the way to the Seven Churches as to look as if a crop had been sown.

Saxifraga hypnoides. Common.

Blechnum boreale. Not scarce.

Asplenium Ruta-muraria. Abundant.

——— *Trichomanes*. In plenty.

——— *Adiantum-nigrum*. Not frequent.

Polypodium vulgare. Quite common.

Ceterach officinarum. By no means frequent.

Scolopendrium vulgare. Of large size : in the fissures along with the *Adiantum*.

Pteris Aquilina. Stunted, but scattered over the whole island.

Bartsia Odontites. Everywhere a perfect weed.

Astragalus hypoglottis. Rare.

Rubus saxatilis and *cæsius*. Both abundant, the first in such profusion as in many places to be the only covering of the rock. They were both in fruit, the former with its bright red, and the other with its dull blue berry, both very acidulous.

After spending two days on the island, I returned with my companion to Roundstone. Here I was fortunate to find *Allium Hallerii*, which you so much wished me to obtain. After being detained for some days at Roundstone by bad weather, I took leave of my very kind and talented English friend on the 17th of September, and pro-

ceeded to Clifden. I found nothing worthy of notice in this picturesque place, but visited Mr. Darcy's castle and green marble quarry. My usual stay-away time had now expired, and though I could not go so far as to say,—

“Tired of the mountains and pure air,
And sick from being devoid of care,
I pined to see the town and folk
And swallow down delicious smoke :”

Yet I felt anxious to see home and friends once more.

You are perfectly aware that I always send home *living* plants of those species I consider rare or interesting, and you will vouch for my having done so on the present occasion.

L. OGILBY.

Prussia Street, Dublin,
October, 1845.

BOTANICAL SOCIETY OF LONDON.

October 3rd, 1845.—Edward Doubleday, Esq., V.P., F.L.S., in the chair.

Mr. B. D. Wardale exhibited fresh specimens of *Lastrea cristata* (*Presl*), collected by him at Bawsey Heath, near Lynn, Norfolk, on the 1st inst.

The Secretary announced that British plants had been received from Dr. Bidwell, Mr. G. S. Gibson, Mr. G. Fitt, Mr. W. D. Biden, the Rev. A. Bloxam and Miss Sawbridge.

Read, “Remarks on the Potato Murrain,” by H. O. Stephens, Esq., (see p. 339).

BOTANICAL SOCIETY OF GLASGOW.

July 29, 1845.—The Society met in the College at half-past 7, P. M. Dr. Balfour, President, in the chair.

Dr. Bottinger made a report on the state of the Society's Herbarium.

Dr. Balfour exhibited a growing specimen of *Phallus impudicus*, which had been gathered in the undeveloped state, near Linlithgow,

and had been put into a pot among mould and leaves. It had burst the volva and pushed up its stipe and pileus to the height of several inches in the course of the night.

He also showed a specimen of Babel bark, imported from Calcutta, for the purpose of tanning. He next showed a specimen of coffee, covered with what is technically called parchment, or the thin, brittle covering which is spread over the seed within the pulpy part of the fruit. Coffee was occasionally imported in this state with the view of being cleaned and winnowed in this country, but it was not found profitable. He also exhibited a specimen of a species of *Mespilus*, destroyed by the attack of a moth of a gregarious nature. He then read extracts from a letter from Dr. R. C. Alexander, dated Naples, 21st June, 1845. "I arrived here" Dr. A. writes, "about the middle of November, and had time before the winter set in, to collect a good deal, and to get acquainted with the beautiful scenery round Naples. In the north of Europe people talk of the south of Italy as though there were perpetual spring here during the colder months. There never was a greater error. I have known frosts as severe at night as I have ever witnessed in England, though certainly the mid-day sun soon restored the usual appearance of things. But besides such occasional pinches, there was a continuance of cold, damp, wretched weather till the end of March, now and then a brilliant day or two, but nothing like spring. Many of the shrubs came into blossom and made a brilliant show,—the splendid *Lithospermum rosmarinifolium*, *Cytisus triflorus*, *ramosissimus*, *laniger* and *infestus*, *Erica arborea*, *Passerina hirsuta*, *Daphne collina*, *Teucrium fruticans*, *Anagyris foetida*, &c. Still it was so completely winter that I started for Palermo, and spent two months, April and May, in Sicily. Prof. Tineo showed me every possible kindness, and what with good advice as to localities and pretty fair weather, I collected 270 species that I had never before seen growing. Few enough, you will think, for the two best months of the year, in so rich an island as Sicily. But in that, too, we northerns are under a delusion. A vast number of the species in catalogues are only other names for our own plants. When I ask the Professors and the resident botanists, to point me out any difference between their plant and the similar one of the north, they usually laugh, and tell me it is a '*Permesso del nostro Giovanni*':—our good friend John has amused himself with making a new species of an old one. Then from the mildness of the climate there is something blossoming all the twelve months of the year, and adding to the catalogue, while the foreign botanist can only devote a few weeks to herborizing

there, and misses a much greater proportion of the Flora than in Switzerland for instance, where in four months he could collect much more than in the same time in Sicily. The island is not beautiful on the whole. Palermo has a fine site, and the road from Messina along the coast is one of the finest that I know. But the want of forests gives a bare, African look to the scenery. The interior of the country has a very desolate look. For fifteen or twenty miles one does not see a cottage or dwelling of any kind. Plains covered with *Arundo ampelodesmos* and *Chamærops humilis*, with a dark, deep soil, fit to bear anything, here and there broken up, but apparently neglected for want of inhabitants. Those that are there live in large *cottage cities*, where, except the monasteries and church, everything bespeaks poverty. There is not one good house to 10,000 inhabitants, and yet there is no squalid misery. Far from it, the people are better clothed perhaps, than in any other south European country. It seems as if the population were wearing out, unable to keep up its numbers, as is the case in Greece, where Sclavonians have, even in the Morea, replaced the ancient race. * * * *

Upon *Ætna*, where I hoped to have found something peculiar, as upon the largest European volcano might be expected, I got very little indeed. The *Berberis* is one of those 'Permessi,' really nothing but *vulgaris*. The *Astragalus Siculus* was the only plant that I had not seen elsewhere, and upon other (not volcanic) strata.

I have made some delightful excursions in the mountains nearest Naples. Everything reminded me of the Illyrian provinces of Austria, although few of the species are identical with their Austrian congeners. At between 4000 and 5000 feet there are many beautiful sub-alpine plants, more than I should have expected in this latitude, but it is still rather too early. I mean to visit the Abruzzi in July. These are Alps of 800—9000 feet.

In this country the monasteries replace the excellent inns of the Swiss, Tyrolese and Austrian Alps."

The next communication was an account of various trips by Dr. Balfour and his pupils. The first being to Ardenenny and Loch Eck, on the 28th June. The party examined the rocks and woods in Glen Finnart, and proceeded towards the shores of Loch Eck, skirting them as far as Ben More and thence walking to Kilmun. The chief plants noticed were *Hymenophyllum Wilsoni*, *Osmunda regalis*, *Jungfermannia minutissima*, *Sphærophorum compressum* in fine fruit, *Rubus saxatilis*, *Saxifraga aizoides* and *stellaris*, *Gymnadenia alba*, *Carex stricta*, *fulva* and *remota*, *Polygonum Bistorta*, *Sedum*

anglicum, *Silene maritima* on sandy shores of Loch Eck, *Serrafalcus commutatus*, *Carum verticillatum*. In the woods of Glen Finnart fourteen species of ferns were gathered.

Another trip was undertaken to Bute, on the 4th of July. Dr. Balfour and his party proceeded from Rothesay to Mount Stuart, picking in the way, *Pinguicula lusitanica*, *Saxifraga aizoides*, *Habenaria chlorantha* and *bifolia*, *Anagallis tenella*, *Osmunda regalis*, &c. The party visited the gardens at Mount Stuart, where many delicate plants thrive well in the open air, such as *Rhododendrons*, *Azaleas*, *Fuchsias*, *Camellias*, *Hydrangeas*, *Robinias*, *Liriodendrons*, &c. Many evergreens, such as species of *Laurus*, and *Pinus* and *Thuja* had attained a large size. Leaving Mount Stuart, the party proceeded to Kingarth, whence next day they walked by the shore towards Scalpsie bay. In this walk they gathered *Hypericum elodes*, *Utricularia minor*, *Carex vesicaria*, *Cotyledon Umbilicus*, *Sinapis monensis* and many other good plants. From Scalpsie bay they returned by Fort Fad, to Rothesay.

On Thursday, July 10th, Dr. Balfour and his party visited Arran and examined the hilly districts of the island, especially Goat fell and Cior More, whence they proceeded to Loch Ranza. From this they returned by the coast of Arran and Corrie to Brodrick. Dr. B. gave an account of the geological features of the part of the island visited, and enumerated some of the more important plants gathered, specimens of which were exhibited. One of the most interesting plants noticed was *Pyrus pinnatifida*, which was picked in considerable quantity on the banks of a mountain stream which terminates at Loch Ranza.—J. H. B.

Investigation of the specific distinctions of *Ceanothe pimpinelloides*,
C. peucedanifolia and *C. Lachenalii*. By EDWIN LEES,
Esq., F.L.S.

FROM various inquiries I have received about *C. pimpinelloides*, Linn., it would appear to be either misunderstood or of very local occurrence, and at all events of uncertain appearance, as I have found out by experience; and from Mr. Mill's observation (*Phytol.* ii. 116),

as well as the doubts on the subject mentioned by Dr. Bell Salter and others, its erasure from the British Flora by Mr. Babington, and its subsequent restoration on the examination of authentic specimens gathered by myself, by Mr. Ball,* I imagine botanists in general do not easily recognize it. I have therefore felt anxious to elucidate, if possible, the specific distinctions between the three related species of *Œnanthe* designated above, so that no further doubt may exist on the subject. I was unable to accomplish this last year, as my old locality at Powick was unproductive, and during a peregrination of three months in North Wales, not a specimen of the genus fell under my review, save *Œ. fistulosa* and *Œ. crocata*. In the cycle of events, however, "Saturnian times return;" and the present season has produced me an abundant harvest, not only of *Œ. pimpinelloides*, but of *Œ. peucedanifolia* and *Lachenalii* also, so that having had a previous acquaintance with *pimpinelloides* of fourteen or fifteen years, I can now speak with some confidence.

First on the habitats of the three *Œnanthes*. It is curious that *Œ. pimpinelloides* is stated by Smith and Hooker, as well as other botanical writers, to grow in "salt marshes," but I much doubt whether this is ever the case. For, as I have before stated in my 'Botany of the Malvern Hills,' I have always found it "growing on the driest ground." In fact, it seems to delight in the very driest red marl meadows, where the ground is so hard that it is a difficult task, without a strong digger or trowel, to get the plant up by the roots. Indeed, I have gathered it on the very summit of Wainlode Cliff, Gloucestershire, where the soil is a stiff lias clay and limestone. Unfortunately, a good look-out is required to get it in perfection, for it flowers just as the grass is fit for mowing, and if not taken in the nick of time, the scythe remorselessly cuts down every plant. On the other hand, the farmer gives great discouragement to any assault on his mowing grass, and unless one meets with it in a field left for grazing, it is necessary to be sparing in getting many up. One beautiful little meadow at Powick, near the road to the Old Hills, contained this year hundreds of plants, but without trespassing unnecessarily on that, I have found an adjacent strip of barren, thistly pasture, which gives me all I want at present. In July last, a curious and pretty appearance presented itself to my view in a large pasture at Maddresfield, three miles east of Great Malvern. The field was covered with bushes of *Genista*

* 'Annals of Natural History,' vol. xiv. pp. 4—7.

tinctoria, brilliant with its golden flowers, among which, and overtopping them with pure white, densely clustered umbels, grew abundance of *Cenanthe pimpinelloides* most luxuriantly, while the green turf itself was bedecked with numerous plants of *Spiræa Filipendula*, whose tall stems trembled with their paniced loads of rose-tinged blossoms. This was a perfectly dry and hilly meadow.

But *Œ. peucedanifolia*,* of Smith, is really a marsh plant, and I have never found it except in wet places, or low flat meadows close to water, but as far as my observation goes, always fresh. I have met with it abundantly in Longdon marshes, near Upton-on-Severn, in the Severn Ham at Tewkesbury, and on the banks of the Severn, Deerhurst, Gloucestershire, as well as on Kempsey Ham, below Worcester. The Rev. Andrew Bloxam also finds it in a marshy spot on Bosworth Field, Leicestershire.

Œ. Lachenalii, though a marsh plant, has, however, quite a different habit from *Œ. peucedanifolia*. It seems entirely confined to muddy ditches, absolutely growing in the water in many instances, and sending down its elongated vermiform tubercles so deep into the mud, that it is very difficult to get them out without breaking. My friend, the Rev. Andrew Bloxam, incumbent of Twycross, Leicestershire, well known for his botanical zeal and acumen, kindly invited me to gather the plant in his company this season, for I had it not near me to study; and he took me to a lonely lane close to Sutton Wharf, on the Ashby canal, on the borders of Bosworth Field. Here we found the plant growing abundantly in a muddy ditch, so deep, and half filled up with thorns, that it was exceedingly scratching work to the fingers to get up any number of specimens. Although this was the latter end of August, I was surprised to find that the *Cenanthe* here located was only just coming into flower, while a month previously I had considerable difficulty in meeting with *Œ. peucedanifolia* even in fruit, so soon does it wither after flowering, and *Œ. pimpinelloides* flowers constantly in June and July. So that it appeared at once evident to me that the three plants could be kept distinct by attention only to the period of their flowering; and Mr. Bloxam concurred in this observation, remarking that *Lachenalii* remained in flower to the end of September. This is worth noting, as botanists have generally completed their collecting stores before

* According to Smith, Hooker and Babington, the *Œ. peucedanifolia* of Pollich, which name I should think it preferable to retain, though Mr. Ball calls it *Œ. silaifolia*, *Bieberstein*, and Mr. Watson suggests that it should take the name of *Smithii*.

that time. To complete my knowledge of the subject, I determined on my return into Worcestershire to have a field-day at Longdon Marsh, near Upton-on-Severn, thinking possibly that *Œ. Lachenalii* might be found there, as I had seldom examined the marsh botanically so late as September, though within my legitimate district. I accordingly beat up the bushes between Malvern and Longdon the first week in September, but with no success near Longdon; nor in a well known part of the marsh, where I had previously gathered many plants of *Œ. peucedanifolia*, was there the least appearance of *Lachenalii*. At last I accidentally got into a wild lane almost unknown to me, between Welland and Castlemorton, having very deep, muddy ditches on either hand, nearly filled up with an exuberant growth of *Helosciadium nodiflorum*; and looking closely as I went along, a single umbel of an *Œnanthe* presented itself on the side of the ditch, which on getting up the root proved to be *Lachenalii*. Finding myself now on the right scent, I got on the other side of the hedge, and here, in a ditch or deep furrow running across a neglected, very boggy pasture, I was delighted to perceive a whole host of the plant encamped, with banners displayed. I quickly broke in upon their entrenchment, but they were all so deeply rooted in such a tenacious mud, that it was with great difficulty I could disentangle them from it, and secure my prisoners. A farmer came up to me before I had finished my operations, wondering what game I could have in view, and from him I learned that the spot was called the Welland Marshes. I thus, however, add *Œnanthe Lachenalii* to my Malvern Flora, and to that of Worcestershire also, for I believe no other person has previously met with it in the county. I now feel assured that the *Œnanthes* said to grow in salt marshes, and the muddy ditches on their confines, ought to be referred to *Œ. Lachenalii* and not to *pimpinelloides*. At all events, I now find those I have myself formerly gathered on the coast of Cardiganshire and Pembroke, as well as on Cromlyn Burrows, near Swansea, and Braunton Burrows, Devonshire, and which, from their very elongated roots, I was at the time dubious about, are all really referable to *Œ. Lachenalii*.

Having thus entered into detail on the different habitats of the three plants, I trust to be able to demonstrate their specific distinctness by an examination of their roots, to which I have paid particular attention, and in illustration of this I refer to the annexed representations, sketched from plants just taken from their places of growth. And here I would remark, that the general character of the root as thus exhibited can be decidedly depended upon; for though its size and

length may be variable, according to the luxuriance and age of the plant, still in *CE. pimpinelloides* the tubercles are always seated on evident stalks: those of *CE. peucedanifolia* are invariably thick and sessile, more or less elliptical, and fleshy; while those of *CE. Lachenalii* are long, slender, vermiform, thickening only towards the posterior end, and that very gradually. Thus we may present these differences in a succinct form, which, in connexion with the cuts, will render the matter fully intelligible.

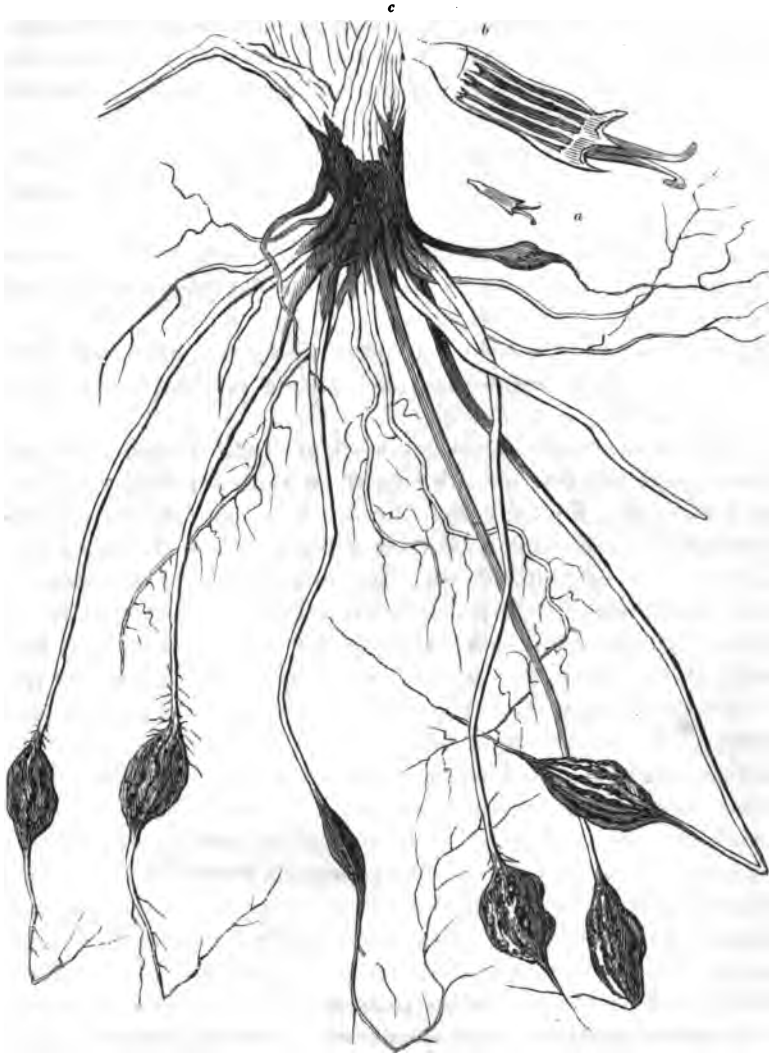
Root consisting of many widely-spreading round or ovoid scaly tubercles on lignose stalks, terminating in fibres.—*CE. pimpinelloides*.

Root of elliptical or pyriform thick fleshy sessile naked tubercles, suddenly swollen at the posterior extremity, graduating into fibres.—*CE. peucedanifolia*.

Root of long slender fleshy vermiform tubercles, clothed with fibres, very gradually incrassated, and ending in long fibrillæ.—*CE. Lachenalii*.

By attending to the characters thus laid down, the root alone will be found perfectly discriminative in these three species; and this is very remarkable, for cursorily noticed, *CE. pimpinelloides* and *CE. peucedanifolia* can scarcely be distinguished from each other except by a very nice eye, though there are other points of distinction to which I shall presently revert. In an early stage of growth, the tubercles of *pimpinelloides* have very short stalks indeed, but these rapidly extend themselves around the plant, so that in maturity then are far removed from it, and are broken off unless the plant is taken up with care. In perfection they are marbled with scales, often become angular from obstacles they meet with in progressing through the soil, and have a pleasant nutty taste. I should conjecture these tubercles to form receptacles of nutriment to keep up the growth of the plant in those very dry meadows where it grows, for at the close of summer the majority of them are found shrivelled up, dry, and exhausted. The tubercles of *peucedanifolia* vary considerably in thickness and length, even on the same root, but they are totally different from those of *CE. pimpinelloides* in their constantly sessile character, and though some of them are as slender as those of *CE. Lachenalii*, there are always others in company with them thick and fleshy, elliptical, and suddenly swollen towards their base. Sometimes they are so suddenly incrassated, as to assume a pyriform aspect. The tubercles of *CE. Lachenalii*, on the other hand, are *all* uniformly slender and vermiform,* imperceptibly thickening towards their termination, and

abundantly fibrous. In luxuriant specimens they are four or five inches long, and almost as thick and numerous as in the bird's-nest



Ceanothe pimpinelloides.
 a. Fruit, natural size. b. The same magnified. c. The root, natural size.

orchis. But though shorter in smaller plants, their long, slender character is always remarkable. Another curious trait in the root of this

species is, that the tubercles are occasionally branched, secondary tubercles arising from the primary ones, and they are often studded with points from which fibres originate, which gives them a striated appearance.



Oenanthe peucedanifolia.

a. Fruit, natural size.

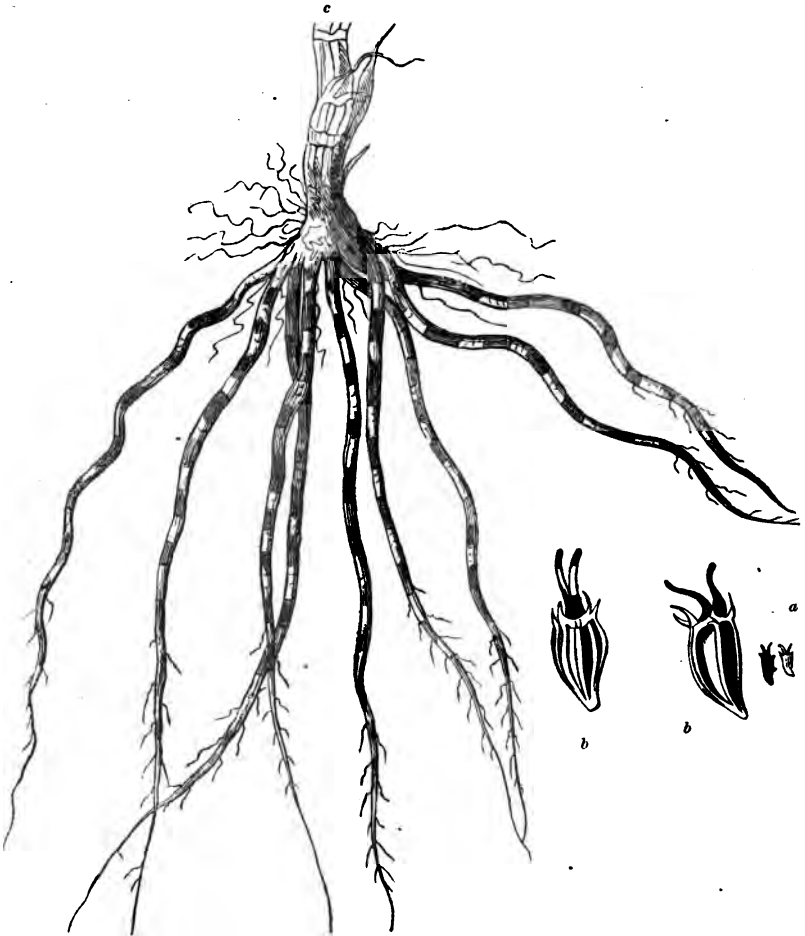
b. The same magnified.

c. The root, natural size.

I have been anxious to represent and define the roots of these *Oenanthes*, as much doubt has been thrown upon the subject, and these organs are too frequently unnoticed by British botanists. But

I shall now attend to the general appearance and description of the plants, so as to found our discrimination on other points, which will settle the matter for the future.

Mr. Ball has given an elaborate Latin description of our three allied species of *Ceanothe* in the 'Annals of Natural History,' but there are



Ceanothe Lachenalii.

a. Fruit, natural size.

b. The same magnified.

c. The root, natural size.

some important omissions, and the differences between each are not so clearly contrasted as to remain fixed upon the mind. But he had not then seen the root of *C. Lachenalii*, and considers the disposition and

proportion of the leaves as much to be depended upon, but doubts the constancy of the form of the root, while, in fact, the reverse is the case. I shall therefore touch upon the distinctions between *Œ. pimpinelloides* and *Œ. peucedanifolia*. Both appear so similar when growing, that a practised eye only can detect the difference between them without looking at the radical leaves. But these, when not withered up, are very discriminative, for in *Œ. pimpinelloides* they are bi-pinnate, the pinnulæ broadly elliptical or wedge-shaped, so deeply cut as to be almost pinnatifid, the segments very acute, mucronate, with a broadly sheathing, membranous petiole; while in *Œ. peucedanifolia* there are mostly no radical leaflets at all, or if any, they are ascending (not extending *horizontally*, as in *pimpinelloides*), and they agree entirely with the stem-leaves, viz., bi-pinnate, with acute, entire lanceolate or linear pinnæ. But the stem-leaves are exceedingly variable in aspect, both in *pimpinelloides* as well as *peucedanifolia*; frequently they are only simply pinnate, and then the pinnæ are very long, narrow, linear and acute. Sometimes the radical leaves of *pimpinelloides* have their pinnæ almost as narrow as those of the stem-leaves, and then without examining the root it becomes very difficult to distinguish it at first sight from *Œ. peucedanifolia*. The upper leaves of both are simply pinnate. No dependance can be placed on the general involucre, which, though stated by Smith to be "numerous" in *Œ. pimpinelloides*, are so far from being so, that scarcely one specimen in twenty has any at all, or only a single setaceous leaflet; sometimes, however, an involucre of five or six unequal leaflets is present. On the other hand, *Œ. peucedanifolia*, said by Smith to have no general involucre, has very frequently one, and sometimes several leaflets at the base of its umbel. The umbels in *pimpinelloides* have from six to fourteen rays, while those of *peucedanifolia* have never more than eight;* the umbellules are many-flowered, very dense, when in perfection forming globular heads; the external florets, which have very large petals, unequal in size, are barren, on long pedicels, the internal fertile florets on short swollen callous ones. In *Œ. peucedanifolia* the internal pedicels are not at all swollen, nor is the fruit so densely clustered. This latter is a stouter and taller plant than *pimpinelloides*; often exceeding a yard in height, with a thick, striated, hollow stem, which, after flowering becomes incapable of supporting itself, so that it then sinks down upon the grass beneath it, and is so

* After flowering, however, the external barren florets fall off in both species, and then this character is not so apparent.

inconspicuous that it is difficult to detect it. The exterior florets of the umbellule are elevated upon long pedicels, and being barren, drop off, leaving only the dense, fertile, almost sessile florets of the centre, whose divergent styles become very stiff and bristly, and though white at first, assume ultimately a bright vinaceous tint. This species flowers early in May, nearly a month before *Œ. pimpinelloides*, and has altogether vanished from the scene long before *Œ. Lachenalii* appears.

Œ. Lachenalii varies much in size according to the place where it grows, but rises to upwards of four feet in height if growing in a deep ditch, the stem striated and fistulose. The radical leaves, when present, are discriminative, and very different from those of *pimpinelloides*; they are simply pinnate, with pinnatifid, bifid, or trifid pinnæ, their segments broadly lanceolate, entire, blunt. The radical and stem-leaves are all on long, membranous petioles, and sometimes the latter in small specimens quite agree in character with the former, but in general they are simply pinnate, the pinnæ linear-lanceolate, very acute; the lower stem-leaves are sometimes bipinnate, or rather the pinnæ have their segments bifid or trifid, but the upper leaves are always simply pinnate. The general involucre consists of six, seven, or eight linear leaflets, often attended by a simple elongated leaf, but it is by no means constantly present, though more generally so than in the two other species. The umbels consist of five to sixteen spreading radii on long peduncles; the umbellules consist of numerous florets, the external ones barren, on long pedicels, the internal ones crowded together, almost sessile. Involucella of many lanceolate leaflets, paler and membranous at the edges, shorter than the exterior pedicels. Petals white, radiant, obcordate, smaller than in either *Œ. peucedanifolia* or *pimpinelloides*, nor are the flowers so aggregated as in the latter species.

Mr. Babington in his *Manual* refers the *Œ. pimpinelloides* of Smith, in 'English Botany,' 347, to this, and I believe that *Œ. Lachenalii* is there really represented, though the root is not fully given.* In the 'English Flora' it is likely enough that *Œ. Lachenalii* and *pimpinelloides* were confounded together, but from Smith's statement of the radical leaves being "doubly pinnate," and the leaflets "wedge-shaped with one or two notches," I conclude he had *pimpinelloides* at least

* I have carefully compared specimens of *Œ. Lachenalii* with this plate, and therefore so far coincide with Mr. Babington. Yet I am inclined to think, that in the English Flora, Smith had also *Œ. pimpinelloides* in his contemplation.

partly in view. I have not, however, seen his specimens. His salt marsh localities, doubtless, belong to *Œ. Lachenalii*; but this may now be easily cleared up.

I have delayed to speak of the fruit of the three species, thinking it better to present their peculiarities in juxtaposition, as I think it will then clearly appear that from this character also, the species can be accurately discriminated as distinct from each other.

Fruit cylindrical, sharply ribbed, of nearly equal breadth throughout, the base callous and incrassated; styles nearly straight, divergent only at the apex, arching at the extremities, as long as the diachenium.—*Œ. pimpinelloides*.

Fruit oblong, contracted below, deeply furrowed, the base callous but not enlarged; styles widely divergent from the very base, and longer than the diachenium.—*Œ. peucedanifolia*.

Fruit small, inversely conical, with thin prominent ribs, compressed, always narrow at the base but not callous; styles divergent, rather incrassated, only half the length of the diachenium.—*Œ. Lachenalii*.

In all three species the diachenium is crowned with the erect pointed persistent calyx. The length of the styles in *Œ. pimpinelloides* and *Œ. peucedanifolia* gives the fruit in those species a peculiar bristly appearance, a character scarcely noticeable in *Œ. Lachenalii*; and while in *pimpinelloides* the diachenia are rigidly stiff and erect, closely pressed together, in *Lachenalii* they are comparatively lax, and by no means closely in contact. Still, the flowers in the umbellules of the latter are so numerous, that pressing in some degree upon each other, the fruit is affected thereby, and thus the diachenium is often narrow and elliptical. It is constantly smaller than in either of the preceding species. The sketches of the fruit will show their distinguishing characters, so that they cannot be mistaken.

I trust the British botanist will now be able satisfactorily to identify the three species of *Cenanthe* I have here examined, so that there can be no further dispute or misunderstanding on the subject. I have tested them in all their details, and their distinctness surely cannot be doubted. There is certainly a general similarity in the foliage of all, but the radical leaves of *Œ. Lachenalii* are very different to those of *Œ. pimpinelloides*. I rely, however, on these three points to prove my case: *popularly* the time of flowering, so different in each; *practically* the shape of the roots, which is always available; and *on the principles of botanical science*, the form of the fruit;—all now ascertained facts of distinctiveness, which combined together, must carry conviction to every mind open to receive the truth.

With regard to the distribution of the plants under review, if I am correct in my surmises, founded on my own gatherings, *Œ. Lachenalii* will be found pretty generally located in the salt marshes of the coast, as well as in deep, muddy ditches of the interior, and according to Smith, on Mr. Mackay's authority (but mistaken for *Œ. pimpinelloides*) extending far into Scotland. Mr. Ball states that he has received it from the coast of Galloway, one of the localities Smith mentions. I have myself observed it on the Welsh coast, from Swansea to Borth morass, six miles north of Aberystwith. *Œ. peucedanifolia* is certainly principally a denizen of marshes in the interior country, and thus in the midland counties it is of more frequent occurrence than either of the other species here mentioned, though not so abundant in its localities. I find it rather plentiful in Gloucestershire and Worcestershire. *Œ. pimpinelloides* appears to be truly local, though abundantly developed where it does occur, at least in favourable seasons. My friend, the Rev. A. Bloxam, who has botanized extensively in Leicestershire, tells me he has never seen it there, and I have not detected it in any of my excursions in Wales. It is absent also from the Rev. W. A. Leighton's 'Flora of Shropshire.' Yet in the dry, hilly meadows about Powick and Maddresfield, towards the Malvern Hills, Worcestershire, it luxuriates on the red marl, and on the same soil at Forthampton, Gloucestershire. The true plant has also been shown me by Mr. Buckman, of Cheltenham, growing at Marl Hill, near that town. It will now probably be found in other dry, inland spots when diligently sought.

EDWIN LEES.

P. S.—On the words "*all uniformly slender and vermiform*" at the bottom of page 358.

I can find no difference in this respect in the youngest or oldest plants, except in the greater thickness of the tubercles in the latter. The more robust the plant, the thicker and longer are the tubercles, but they never assume the appearance of those of *Œ. pimpinelloides*.

E. L.

Henwick, near Worcester,
September 23, 1845.

Correction of certain errors in Dr. Balfour's communication to the Botanical Society of Glasgow. By G. A. WALKER ARNOTT, L.L.D., F.L.S., &c.

IN the last number of the 'Phytologist' (Phytol. ii. 319), are two statements rather startling to the systematic botanist, and which perhaps you will allow me to correct; they are the more remarkable as coming from one who holds a public appointment as teacher of Botany.

The learned Professor states that he exhibited to the Botanical Society of Glasgow specimens of several species of *Cypripedium* from various parts of the world, among which were some from Brazil; and on the authority of Steudel's 'Nomenclator Botanicus,' asserts that there are *four* species natives of that country: of course, as Steudel gives no descriptions, and as Dr. Lindley appears to be ignorant of so many, Dr. Balfour must, before affirming this, have consulted the 'Flora Fluminensis,' which is the original authority for all these species; but on the other hand, I feel somewhat puzzled how any one who knows what a *Cypripedium* is, did not at once perceive that only *one* of the four can belong to the genus; the other three exhibiting the truly tropical forms of *Orchidaceæ*. The only true Brazilian species is probably the same as that in Von Martius' herbarium, noticed by Dr. Lindley, and supposed not to be distinct from what has been likewise found in Guiana. Two species only can therefore be said to grow in South America, on the eastern side of the Andes. The geographical distribution usually assigned to the genus can therefore be scarcely said to be invalidated by these aberrant and very little known species, for although six are enumerated as natives of tropical America, four belong either to the Andes of Peru, or to the north of the isthmus of Panama.

But the other statement contains an important error in medical Botany, in so far as Dr. Balfour refers the *Mudar* plant of India to *Calitropis gigantea* of Brown. Various memoirs have been written on the subject, particularly in India, but since 1835, when Dr. Wight took up the subject in the Madras 'Literary and Scientific Journal,' p. 69, the old hypothesis of *C. gigantea* being the *Mudar* plant, has not been revived till now, by Dr. Balfour. The properties of the two are different. The difference between the species was in some measure pointed out in the 'Proceedings of the Calcutta Medical and Physical Society' for 1824, but Dr. Wight, by giving a figure of the *Mudar* plant, with dissections of the gynostigium, enabled all to com-

prehend the distinction more clearly. Dr. Hamilton, at one time, gave it the barbarous name of *C. Mudari*, but afterwards suspected it to be the same as *C. procera*, of Persia. Dr. Wight, in the paper already referred to, follows Hamilton in calling it *C. procera*, probably through inadvertency, as in his MSS. of the East India Asclepiadeæ, left by him in Scotland, and published in the 'Contributions to the Botany of India,' it is called *C. Hamiltonii*, and is accompanied with the remark that the Persian *C. procera*, judging from Andrew's figure, appeared very distinct; a supposition which has been since verified. While on this subject I may allude to the little confidence one must place in a mere catalogue of names, such as Steudel's 'Nomenclator Botanicus.' In that work, published in 1840, only three species of *Calitropis* are mentioned, and all are said to be natives of India, while six years previously Dr. Wight described from India five species, the Persian one forming a sixth. The *C. acia* of Hamilton and Steudel is the *C. herbacea* of Wight, or *Asclepias herbacea* of Roxburgh's 'Flora of India.'

G. A. WALKER ARNOTT.

Arlary, October, 1845.

On the country of Cliococca tenuifolia. By G. A. WALKER ARNOTT, L.L.D., F.L.S., &c.

ALTHOUGH the 'Phytologist' is principally devoted to British Botany, still you will perhaps allow me to allude to the *Cliococca tenuifolia* of Mr. Babington, published in vol. xix. of the Linnean Society's Transactions (p. 33, t. iii.). Mr. B., on the authority of the Cambridge gardens, states it to be a native of New Holland, but any one acquainted with South American Botany will at once recognize its affinity with *Linum selaginoides* (Lam.). Of this Chamisso and Schlechtendal in the 'Linnæa,' i. p. 67, describe the ten hard nuts of the fruit. But the most complete account of it is by St. Hilaire, in his 'Flora Brasiliensis Merid.' i. p. 130 and 131, published in 1825. St. Hilaire there points out the mistake into which De Candolle had fallen as to the colour of the petals, which are not yellow, but "albida vel rufescentia, apice quandoque rosea;" and in the description of the fruit, demonstrates that this very species and some analogous ones, reveal the true structure of that organ in the order

Linacææ. Only two points of difference occur between Mr. Babington's description and St. Hilaire's: Mr. B. says the petals are imbricated, while St. Hilaire describes the entire genus with contorted petals; St. Hilaire says that the petals are "in unguem attenuata;" Mr. B. says that they are "hand unguiculata." Notwithstanding these discrepancies, there can be no rational doubt of the identity of the two plants, and this induces a belief that there must be some error in the supposition that Mr. B.'s plant was raised from seeds gathered in the interior of New Holland, as it is only known in herbaria as a native of the southern parts of Brazil, Monte Video, Chili and perhaps Peru, and does not, I believe, occur in any collection from Australia.

G. A. WALKER ARNOTT.

Arlary, 6th October, 1845.

An Account of the Bog Lands of Sussex. By F. A. MALLESON, Esq.

ON examining a geological chart of the county of Sussex, it will be seen that there is an outlying stratum of sandstone, known as Shanklin sand, running parallel with the South Downs in their whole extent, at the distance of a mile or two; and with an average breadth of two or four with us, though much more at the continuation of the same formation in Surrey. This is so distinct a feature of the country that it cannot fail to attract the notice of every traveller of common observation, who approaches the hills from that central tract of the great chalk basin, denominated the Weald, or Wild, and who perceives that he must necessarily cross a sandy or a boggy district. In most places this sand is the soil of heaths, both hilly and level; in others that of bog, marsh or quagmire, and in the alluvial districts of good pasture land.

The formation and progress of a bog is a subject of considerable interest, especially when it is remembered that it is always naturally in a state of increase. In the uncultured territories of the vast continent of America, a marsh is frequently originated by the accidental fall of a few trees into some stream that had hitherto flowed uninterrupted through the forest. The waters, thus obstructed, overflow and stagnate beyond the banks, rotting and decomposing much vegetable matter incapable of enduring such an excess of moisture. However indispensable the influence of pure, running water may be to some

forms of vegetable life, nothing is more pernicious than a putrid pool; those shrubs and trees, therefore, which are thus attacked, root and branch, perish and fall, adding their decaying limbs and leaves to the increase of the destructive powers now in full operation. Minor streams overflow in the same neighbourhood, acted upon by similar or collateral causes; and where a luxuriant verdure once gladdened the woods, the lapse of a few years shows extensive tracts covered with blackening vegetation, and emitting those unhealthy exhalations which the naturalist finds it his best interest seriously to guard against. But, once formed, this marsh has become a fit soil for the propagation of plants peculiarly adapted to it, which rise and fall in their appointed seasons, gradually, though slowly, increasing the thickness of the mass of decayed vegetation. In course of time, the land becomes of too solid a texture, by reason of the deposit both of carbon and of mineral soil from chemical and alluvial causes, to support its old dependants, and a new race slowly springs into life,—in our climate principally heaths; in South America, chiefly species of Cactus, and enormous grasses and Cyperaceæ. These are precisely the causes distinctly seen in operation in some of the finest districts of Ross and Inverness.

The usual composition, therefore, of the peat of our fens and marshes is *Sphagnum*, and every aquatic plant, the inferior layers of which are always densest, on account of the great weight of the super-incumbent mass. Such extreme density, indeed, is attained in some cases, as to form a substance convertible into ornaments resembling jet, and susceptible of a fine polish. I have seen beautiful sections, though only six to eight feet in thickness, of the peat soil in the great Amberley Wild Brook, in this vicinity, in which the fineness of the texture of the lower peat, clearly demonstrates the efficacy of the decomposing process which has acted on it for centuries. A key to the rate of the increase of bogs might be afforded by the discovery which a labourer of Nutbourne made several years since, of an ancient British lance-head, constructed of copper, buried to the depth of seven feet in a marsh near Pulborough. This relic was lately in the possession of a gentleman at Storrington, since deceased, and has since passed into other hands. The depth of eight feet would give a very slow rate of increase indeed, far less than that of twenty inches in sixteen years, assigned by Mr. Jenyns to the turf of the Cambridgeshire fens, and which seems to be unaccountably rapid; but it must also be taken into account that this peat marsh has pretty frequent demands made upon its contents by the turf-cutters, as well as by the

farmers who cut the long sedges (*Carex ampullacea*, *paniculata*, *teretiuscula* and *axillaris*), for an admirable covering for stacks.

There is every reason for believing that a process similar to that described above, has operated in the formation of every one of the "brooks" in our vicinity; especially the Wild Brook, in which huge trunks of trees, the relics of remote ages, are continually being dug up to this day. In their remains, indeed, we perceive further cause for the creation of a bog, as the deposition of silt and disorganized vegetation in the spaces between the prostrate trunks would have afforded a ready nucleus for fresh deposits. It was here that the interesting discovery was made of that huge boat, of ancient British manufacture, which formed, till lately, the first object of attention in entering the gateway of the British Museum.

A section of the ground usually presents, first, vegetable mould; then, from four to five feet, and in many places more, of peat, containing considerable masses of decayed vegetable matter, consisting of leaves and trunks of trees. A dark blue clay or silt is then reached, containing fresh-water shells, the deposits of ancient floods. A finer clay follows; and then the main foundation of sandstone appears. (Mantell's 'Geology of the S.E. of England').

In those parts of our county which are watered by the Arun, the Cuckmere, Ouse and Rother, all of which annually overflow their banks, and lay the surrounding country under water, a very slow and gradual rise takes place in the soil, amounting to an average of no more than one half or one quarter of an inch per annum. It is well known how considerable a mass of sand, clay, &c., is carried down the stream of every river. If, as is the case with the river Po, the waters are always confined within their proper channel, without ever flooding the land, the deposit takes place in the bed itself, and becomes an incessant source of trouble and weariness to the inhabitants of its banks, who are periodically obliged in self defence to dyke up the river, the stream's level being already more than fifteen feet above the level of the land which it traverses. On the other hand, if an annual inundation regularly takes place, the consequence is a very slow rise of the land, so slow as to be almost imperceptible in the life of a man, though certainly considerable enough to force itself at last into notice in certain instances. One case under my own observation is that of a farm house in Hardham, erected many years ago, in a situation fairly out of the reach of the annual flood, but now, in consequence of the insidious aggressions of yearly deposits of less than half an inch, well drenched almost every winter, the kitchen and its depen-

dencies, with the neat little parlour, all float in streams none of the bluest. A gentleman of this neighbourhood, whose elegant garden borders the Arun at a height of eight feet above the summer level of the river, discovered in the high flood of 1843, that his gay parterres were at last within the reach of the strongest assaults of his encroaching foe, and has added a foot and a half to his garden wall, to be placed above high-water-mark. Should a railroad ever be carried across our levels, it will not be amiss to keep several feet clear of the high-water-mark, out of regard to the probable emergencies of future generations.

A botanist may be allowed to express his regrets at the gradual merging of that richly prolific bog-land into pastures. Where mile after mile of a wild, unchecked vegetation waved and rustled in the wind, all rank with that freedom which the plant enjoys as well as the animal, brilliant with those gaudy flowers, which, by the capricious allotment of Nature adorn the inaccessible marsh even more profusely than more attainable spots, and where tall sedges and rushes shared the land with the delicate cranberry,—there, long, formal ditches have been sliced out in all directions; little by little, the peculiar Flora of the bogs has disappeared, and the farmer calculates his profits, and the landlord collects his rents, out of those territories which erewhile profited none but the humble turf-cutter and *our* curious tribe. The Pulborough brooks, now covered with a luxuriant herbage, retain no signs of having once been a bog, but the existence of a rather coarse sedge (*Carex riparia*), which alone has survived. The Amberley Wild Brook, an immense tract for a county like Sussex, is feeling the effects of deep drainage, and supports considerable herds of cattle. I have never heard here of that plan being adopted which is so extensively carried on in the fens of Lincolnshire. I mean the process of *claying*. Deep holes are dug through the peat until they reach the clay, which is then thrown up, and scattered over the swampy land till a firm ground is obtained, which eventually becomes fit for cultivation. The wages of this work are 15s. a week.

The Nutbourne peat-marsh is well entitled by its richness to be the object of a botanical excursion. It is a mile from Pulborough and very near Heath Mill, a long valley bordered on two sides by hills deeply clothed with the finest heath. I wish it were some other than the common *Erica cinerea*, but this and *E. Tetralix* are the only Sussex species, though why we should have none of the Cornish species too I cannot tell. This marsh and others in the vicinity are known to be dangerous to persons not well acquainted with them. The ground is so treacherous, and the imperfect path-ways are so per-

plexing, that none should venture there too boldly. Cattle are repeatedly straying into the midst of the bog, supporting themselves on the tussocks, but have occasionally sunk in, and I think they only owe their more frequent impunity to the possession of four feet, on two of which they can balance themselves, while the others act as pioneers. Bipedes are less fortunate. On one occasion, after a long afternoon of "peripatetic" philosophy among these mazy marshes, when twilight was advancing, I found six yards of very doubtful soil indeed intervening between dry land and me, with the only alternative of boldly crossing it, or retreating amongst dangers not so light as to be encountered in the dark without careful deliberation. This was a dilemma such as the practical botanist may often expect. "Well," thought I, "perhaps Guizot's '*Recta brevissima omnium*' is after all, preferable to the '*Sat cito, si sat bene*' of the Lord Chancellor," and with a forward dash, which made the dingy bog quake for yards around, four of the lightest and longest strides carried me safe over, though with some remains of a natural apprehension, and a good bespattering. It is a good rule to remember, in botanizing in such places, that *Comarum palustre* denotes unsafe, and *Carex flava* a secure ground.

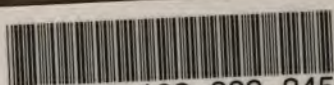
The first object of note in a walk hither, will be the rare *Carex axillaris*, first observed by Mr. Borrer, on a ditch-bank, in the meadow adjoining Heath Mill-pond. I believe it is known but in one other spot in Sussex. This whole neighbourhood may be considered rich in species of *Carex*. With *C. axillaris* is found abundance of the handsome *C. pseudo-Cyperus*; *C. paniculata* and *teretiuscula* form their great tussocks, the accumulation of repeated decay, along the banks of the pond, and about the bogs *C. ampullacea* abounds, and is easily recognized by its slender, hoary leaves. It is not unlikely that *C. filiformis* may be found here too, as Mr. Borrer has pointed out to me, in places unfortunately inaccessible to us, clumps of leaves, much resembling, at a distance, those of this *Carex*. I hope to explore the spot when I find the proper means of doing so with safety. *Carex flava* and *Œderi* are both here, and in their wild state I always find the character of the barren spike sufficiently plain to distinguish the species; though in Botanic Gardens, it seems, the effect of culture is to confound the species by making the male spikes either sessile or stalked indifferently.

F. A. MALLESON.

Pulborough, Sussex.







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